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Targeting the Reading and Behavioral Skills of Young Struggling Readers With and At-Risk for EBD

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Targeting the Reading and Behavioral Skills of Young Struggling Readers With and At-Risk for EBD

by

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Dedication

For my avô, Joaquim “Jack” Gomes – Isto é para você! I love you, deeply. I miss you, terribly. Espero que você está sorrindo onde está. Até eu te ver outra vez...

For my daughters, Éva and Bella—my greatest accomplishments.

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Targeting the Reading and Behavioral Skills of Young Struggling Readers With and At-Risk for EBD

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Abstract: The effects of a multicomponent, reading and behavior support, intervention on the oral reading fluency, word-identification fluency, and off-task behavior performance of first and second grade students demonstrating reading and behavior risk were explored. The intervention was implemented as a supplement to classroom instruction within the secondary tier of a Response to Intervention model. Three students participated in the study. Student achievement scores on curriculum-based measures of oral reading and word-identification fluency were reported. In addition, concurrent data on student off-task behavior was gathered and reported.

A multiple baseline (A-B-C) across participants design was implemented to compare a fluency-building only condition (phase B) to baseline (phase A), and a behavior support condition (phase C) to the fluency-building phase. Results of visual data analysis indicated variable performance across participants and phases, with overall increases in reading fluency and decreases in off-task behavior noted across participants and phases. In addition, data analysis revealed the addition of the behavioral support component resulted in (a) decreases in student off-task behavior and (b) greater gains in reading fluency when compared to performance during the previous phase. At the onset of the study, all participants demonstrated reading and behavior risk. Probes administered

in the final weeks of the study revealed that two participants were no longer in the reading risk range. Despite large gains in oral reading fluency (+35 words correct per minute), one participant was still in the risk range. All participants exceeded their respective realistic and ambitious reading goals. Limitations, recommendations for future research, and implications for practice are presented.

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Chapter 1: Introduction

Since the reauthorization of the No Child Left Behind (NCLB) Act of 2001 (20 U.S.C.6318, 2001) and the Individuals with Disabilities Education Act (IDEA, P.L. 108-446, 2004), there has been an increased focus on access to the general curriculum and academic accountability for students with disabilities (Mooney, Denny & Gunter, 2004; Vannest, Temple-Harvey, & Mason, 2004). In addition to requiring highly qualified teachers in schools, NCLB calls for the implementation of scientifically-based instructional practices (Mooney et al., 2004). Additionally, IDEA and NCLB require that the planning and delivery of special education be designed so that students with disabilities participate and progress in the general education curriculum (Mooney et al., 2004). NCLB has also placed schools under pressure to hold all students, including those with disabilities, accountable for meeting the same rigorous academic standards.

The mandate of NCLB, to hold all students accountable for meeting high academic standards, necessitates the delivery of the most effective and efficient academic instruction (Vannest et al., 2009) for students with and without disabilities. To measure the implementation of these requirements, NCLB requires schools to meet academic yearly progress growth targets. In order to demonstrate adequate yearly progress, students with disabilities, particularly those with and at-risk for emotional and/or behavioral disorders (EBD), require both academic and behavioral interventions (Vannest et al., 2009).

Over the past 20 years, the EBD category has grown substantially (U.S. Department of Education, 2003) and still many more students with or at-risk for EBD do

not qualify for services under IDEA (Lane & Menzies, 2010); yet these students experience many of the same school challenges. Despite the increase in population of students with EBD, Mooney et al. (2004) found that the majority of research regarding academic interventions for this population would not meet NCLB's standard of scientifically-based research. Although one of the primary foci of NCLB is that every child is able to read by third grade, many reading interventions fail to meet the rigor of NCLB's standard for being scientifically-based. According to the NCLB (2008) standard, scientifically-based research must meet the following criteria: (a) use systematic, empirical methods; (b) involve rigorous and adequate data analyses; (c) rely on measurement/observation methods that provide reliable and valid data; (d) allow for replication; and, (e) undergo rigorous and objective expert-, peer-review. The NCLB focus on reading, combined with the pressures of adequate yearly progress, make it imperative for the field to focus greater attention on developing the reading skills of early elementary students who have been identified with or at-risk for EBD (Mooney et al., 2004).

READING

The ultimate goal of reading instruction is to help children acquire all the skills necessary to construct or comprehend the meaning of text (Torgesen, 2002). In order to effectively teach children to read, we need to understand the development of reading. In 1925, William S. Gray presented the first developmental or stage theory of reading comprised of five stages (Indrisano & Chall, 1995). Following Gray in 1947, Arthur I. Gates proposed eight stages of reading to include: characteristics of learners, their

capabilities, limitations and anticipated achievements (Indrisano & Chall, 1995). David Russell, in 1965, presented six stages that highlighted the cognitive characteristics of the learner and implications for teaching reading (Indrisano & Chall, 1995).

In 1975, Jeanne S. Chall presented a six-stage model, later expanding upon it in 1983 and again in 1996. According to Chall's model of reading development, reading abilities and skills change with human development (Indrisano & Chall, 1995). Therefore, reading is different for preschoolers, early elementary students, middle and high school students, and adults (Indrisano & Chall, 1995). According to Chall's model, reading abilities are cumulative and develop over time (Indrisano & Chall, 1995). The presence or absence of prerequisite skills that develop from birth through age five are predictors of later reading achievement (e.g., oral language development, alphabet code, and print knowledge; Indrisano & Chall, 1995).

Additionally, Linnea C. Ehri, in 1995, developed, as Pikulski and Chard (2005) stated, "a carefully researched, elegant theory of how readers systematically progress in stages to achieve fluency" (p. 512). Ehri's model included four stages: pre-alphabetic, partial alphabetic, fully alphabetic, and consolidated alphabetic. Ehri listed prerequisite skills as a foundation for fluency (i.e., letter familiarity, phonemic awareness and knowledge of how graphemes typically represent phonemes in words; Pikulski & Chard, 2005). In addition, Ehri's (1998) theory of reading development required a foundation in language skills and stressed the importance of familiarity with the syntax and grammatical function of the words and phrases being read (Pikulski & Chard, 2005).

Equally important to the development of reading is knowledge about the critical components of reading instruction.

Critical Instructional Domains

In 1997, Congress commissioned the director of the National Institute of Child Health and Human Development (NICHD), in consultation with the Secretary of Education, to assemble a national panel to assess the status of research-based knowledge in the field of reading (NICHD, 2000). The National Reading Panel (NRP), comprised of leading scientists in reading research, representatives of colleges of education, reading teachers, educational administrators, and parents, was assembled. The members identified approximately 100,000 studies published since 1966, and 15,000 studies published before that time (NICHD, 2000). Based on the evidence from the experimental and quasi-experimental studies that met rigorous scientific standards for review, the NRP identified and presented five essential elements of reading instruction: phonemic awareness, phonics, oral reading fluency, comprehension and vocabulary (NICHD, 2000).

Phonemic awareness instruction involves teaching children to identify and manipulate phonemes (the smallest units of spoken language) in spoken syllables and words (NICHD, 2000). The NRP reported that at school entry phonemic awareness and letter knowledge are the two best predictors of reading achievement during the first 2 years of instruction (NICHD, 2000). Torgesen (2002) supported the NRP finding, stating that students who enter first grade with difficulties in phonemic awareness will require explicit and systematic instruction for decoding text.

Phonics instruction stresses the acquisition of letter-sound correspondences and their use in reading and spelling (NICHD, 2000). According to the NRP, "the primary focus of phonics instruction is to help early readers understand how letters are linked to sounds (phonemes) to form letter-sound correspondences and spelling patterns and to help them learn how to apply this knowledge in their reading" (NICHD, 2000, p.8). Early reading skills are critical to the future success of reading growth. Falling behind in these areas results in fewer opportunities to practice reading (Torgesen, 2002). The NRP specified that phonics skills must be integrated with the development of other critical reading skills (i.e., phonemic awareness, fluency and comprehension).

Oral reading fluency, categorized by the speed, accuracy, and expression of the reader, builds on earlier stages of reading development, and has been cited as a critical and essential factor for reading comprehension (Levy & Chard, 2001; NICHD, 2000; Pikulski & Chard, 2005). Students with undeveloped fluency labor through their reading, and in turn spend more time decoding and less time constructing meaning (Levy & Chard, 2001; Pikulski & Chard, 2005), and demonstrate difficulty relating the ideas of the text to background knowledge (NICHD, 2000).

Comprehension, as described by the NRP, is an active and complex cognitive process that requires intentional and thoughtful interaction between the reader and the text (NICHD, 2000). The NRP noted that comprehension is essential to academic learning across content areas and lifelong learning (NICHD, 2000). Comprehension involves decoding words and encoding (constructing) the overall meaning of the text (Levy & Chard, 2001). Directly related to a reader's ability to comprehend text is

instruction in vocabulary, text comprehension, and comprehension strategies, along with teacher preparation (NICHD, 2000). The NRP (NICHD, 2000) reported that both oral and print vocabulary are critically important in oral reading instruction; "the larger a reader's vocabulary, the easier it is to make sense of the text" (p.13).

Characteristics of Elementary Students At-risk for Reading Difficulties

The National Center for Education Statistics (NCES; 2013) reported that mere 35% of fourth-grade school children in the United States are performing at or above proficient in grade level reading, with another 32% not performing at the basic level. Torgesen (2002) indicated a need for strengthening early elementary reading instruction in the areas identified by the NRP. In order to meet the needs of at-risk learners, however, teachers must first identify those at-risk for targeted support.

Assessment and determination of risk among children varies from school to school and state to state (Wiley et al., 2008). To further highlight the variability in criteria for identifying students at-risk, Davis, Lindo, & Compton (2007) note that risk decisions are often made at the school level, with schools setting their own cut-off scores. Drawing from the extensive body of reading risk research, several studies are drawn upon to provide a clearer picture of what constitutes reading *non-responsiveness* and reading *risk* criteria.

Juel (1988) found that children who were later identified as struggling readers entered first grade with little phonemic awareness. By the end of first grade, the *poor* readers hadn't caught up to where the *good* readers were at the onset of first grade. Juel found that although *good* readers' phonemic awareness scores approached ceiling levels

by the end of first grade, *poor* readers did not approach those levels until the end of third grade. Juel further identified slow growth in spelling-sound knowledge to be initially low in *poor* readers. Poorly developed word recognition skills in first grade students led to dislike of reading. Dislike of reading led to less time reading in and out of the classroom. Limited exposure to reading limits the development of vocabulary, concepts, and ideas (Juel, 1998). This pattern of increasing disadvantage is characteristic of Stanovich's (1986) "Matthew Effect," in which poor readers continue to become poorer.

Cavanaugh, Kim, Wanzek and Vaughn (2004) used the following criteria when evaluating study participants as *at-risk* for reading difficulties in their review: low phonemic awareness, low letter identification ability, few pre-school or home literacy experiences, low socioeconomic status (SES) or attendance at a school with a history of low reading achievement. At-risk criteria varied according to age or grade at the time of screening and the particular screening measure used. Davis et al. (2007) defined diagnostic screening measures as brief assessments that provide predictive information about a child's development in a specific academic area.

In their 2002 review of studies that described children who were at-risk based on responses to early reading instruction, Al Otaiba and Fuchs concluded that it may be difficult to generalize characteristics of risk due to the "complex profile of strengths and weaknesses" and the variability of profiles among at-risk students (p. 313). Criteria for determining risk or responsiveness ranged across studies. For example, Torgesen and Davis (1996) selected kindergarten students who scored in the lowest 20th percentile on phonological awareness measures who had not been previously identified for services.

Vellutino, Scanlon, and Lyon (2000) selected first grade students who scored in the lowest 15th percentile on either the Word Attack or Word Identification subtests of the *Woodcock Reading Mastery Test*-Revised.. Although no common definition of the construct of reading risk was determined from their extensive literature review, Al Otaiba and Fuchs (2002) were able to identify seven categories associated with risk: "phonological awareness, phonological memory, rapid naming, intelligence, attention or behavior, orthographic processing, and demographics" (p. 312).

In a subsequent study, Al Otaiba and Fuchs (2006) defined risk differently for kindergarteners and first grade students. Kindergarteners' risk was defined as the inability to segment more than 12 phonemes in 1 minute or to identify more than 11 letter sounds per minute. For first graders, risk was defined in terms of oral reading fluency (number of words read aloud correctly per minute). The benchmark of 40 words or more per minute read correctly, from an unfamiliar grade-level text at the end of first grade, was used (Al Otaiba & Fuchs, 2006).

The variability of characteristics among students at-risk for reading difficulties is well documented (e.g., Juel, 1988, Wiley et al., 2007). Still, students with dual, reading and behavior, risk present a unique set of characteristics. To successfully meet the needs of students with dual risk, teachers must first understand the relationship between behavior and academic achievement.

DUAL RISK: READING AND BEHAVIOR

Relationship Between Behavior and Academic Achievement

The relationship between reading achievement and behavior has been well

documented in the research, though findings have been inconclusive (Lane et al., 2002; Lane, Little, Redding-Rhodes, Phillips, & Welsh, 2007; Lane, O'Shaughnessy, Lambros, Gresham, & Beebe-Frankenberger, 2001; Nelson, Benner, & Gonzalez, 2003; Trout, Nordness, Pierce, & Epstien, 2003). Whereas Lane and colleagues (2001) found evidence of a reciprocal relationship between improvements in reading achievement and decreases in disruptive behavior, Barton-Arwood and colleagues' (2005) findings were inconclusive. Yet researchers agree that this population of students spend more time (a) engaging in unrelated activities, (b) being off-task, (c) in time-out, (d) waiting for instructions, and (e) completing independent worksheets and seatwork (Chard & Kame'enui, 2000; Morgan, Farkas, Tufis, & Sperling, 2008; Vaughn et al., 2002). Additionally, students with and at-risk for EBD have been found to experience less time engaged in academic activities (Vaughn, Levy, Coleman, & Bos, 2002).

Reading Achievement Among Students With and At-risk for EBD

Studies suggest that students with EBD demonstrate underachievement in reading, reading comprehension, vocabulary, and written expression (Lane, Barton-Arwood, Nelson, & Wehby, 2008; Nelson, Benner, Lane, & Smith, 2004; Reid, Gonzalez, Nordness, Trout, & Epstein, 2004). Students with EBD were found to have experienced similar academic achievement regardless of gender (Nelson et al., 2004) or location of educational settings (i.e., rural or suburban; Lane et al., 2010). Lane and colleagues (2008) examined the levels of performance of 42 elementary and secondary students with EBD receiving services in a self-contained school servicing only students with EBD. Findings from the study indicated that group scores were "well below" the 25th percentile

in reading, math and written expression (Lane et al., 2008) and supported the findings of other researchers (Reid et al., 2004; Wagner et al., 2005). Oral reading fluency rates were lower for elementary students, while reading comprehension declined for secondary students (Lane et al., 2008).

Nelson, Benner, Lane and Smith (2004) conducted a cross-sectional study of academic achievement of 155 kindergarten through 12th grade students with EBD receiving special education services to examine how internalizing and externalizing problem behaviors related to academic performance. Findings indicated that students with EBD showed large academic deficits across all of the content areas. These deficits were either stable or worsened over time, as was the case for mathematics (Nelson et al., 2004). Nelson and colleagues also found that students with externalizing behavior (i.e., aggression, attention problems) were more likely to experience deficits in academic achievement than students with internalizing problem behavior (i.e., anxiety, depression, withdrawal, social problems).

Wagner and colleagues (2005) found that students with EBD have some of the poorest outcomes with regard to reading achievement. Among elementary and middle school students with EBD who received special education services, 50% scored in the 20th percentile or lower in letter-word identification, with another 35% scoring in between the 21st and 60th percentiles (Wagner et al., 2005). These outcomes were similar in the area of passage comprehension with 53% scoring at or below the 20th percentile and another 37% scoring in between the 21st and 60th percentiles. The findings of Wagner

and colleagues (2005) are echoed across reading studies conducted with this population (Lane et al., 2008; Nelson, Benner, Lane, et al., 2004; Reid et al., 2004).

Research suggests students with EBD demonstrate underachievement across the reading domain in fluency, comprehension, vocabulary, and written expression (Lane et al., 2008; Nelson, Benner, Lane, et al., 2004; Reid et al., 2004). Despite the negative reports of reading achievement for students with EBD, many questions remain about effective scientifically-based academic (e.g., reading) and behavioral practices for students with or at-risk for EBD (Mooney et al., 2004).

FINDINGS FROM PREVIOUS REVIEWS OF READING INSTRUCTION FOR STUDENTS WITH EBD

The increased need to focus on reading intervention has resulted in a moderate increase in the study of reading achievement and performance for students with EBD (Kostewicz & Kubina, 2008). Over the past decade, researchers have compiled several reviews (Benner, Nelson, Ralston, & Mooney, 2010; Coleman & Vaughn, 2000; Rivera et al., 2006; Vaughn, Levy, Coleman, & Bos, 2002). These reviews have examined the impact of reading interventions on the reading growth of students with EBD.

Coleman and Vaughn (2000) conducted a review of the literature published between 1975 and 1998 concerning reading intervention research for elementary school students with EBD. After finding only eight studies that fit their criteria, Coleman and Vaughn (2000) conducted a focus group with eight elementary teachers who taught reading to students with EBD in an effort to supplement and expand their findings. Although little information could be gleaned from the review of the literature, Coleman

and Vaughn were able to identify two consistencies between the literature review and the focus group. First, cross-age tutoring was an effective method for increasing motivation to read and reading skills among students with EBD. Second, findings supported the efficacy of direct, explicit instruction with this population. Coleman and Vaughn highlighted the paucity of research on reading instruction for students with EBD, stating that it was disconcerting given the movement towards inclusion and federal mandates for access to the general education curriculum.

In a similar way, Vaughn, Levy, Coleman and Bos (2002) conducted a systematic review of observational studies published between 1975 and 2000. Studies included in their review focused on the nature of reading instruction provided to students with learning disabilities and /or EBD. Their review, which yielded nine articles and two dissertations, included only one study with a sample comprised entirely of students with EBD. Several key findings emerged from their review. First, although the amount of time spent on instruction during reading in various settings (general education, special education and/or remedial reading) differed only minimally, the amount of time students were engaged in reading varied greatly. Small-group and individual instruction was found to be more common in studies conducted prior to 1990. Additionally, Vaughn et al. found reading comprehension instruction was often overlooked. Perhaps some of the most alarming findings of their review pertained to independent work (i.e., when students are working on their own), finding that a large amount of reading time was spent completing worksheets and engaging in independent seatwork, and the time spent on such independent activities was even greater among students with EBD.

Unlike Vaughn et al. (2002), the review by Rivera and colleagues (2006) conducted a review focused only on students with or at-risk for EBD. In their review, Rivera et al. (2006) sought to synthesize studies focusing on the effectiveness of reading interventions for primary grade students with or at-risk for EBD. Their review, which included articles from 1975 to 2004, yielded 11 studies that met their criteria. Rivera and colleagues found that the studies that included students with EBD took place within self-contained or resource rooms. Additionally, interventions in studies published prior to the National Reading Panel's (2000) report focused only on accuracy. In contrast to the findings that most reading instruction for students with learning disabilities or EBD was whole group and undifferentiated (Vaughn et al., 2002), Rivera and colleagues found that half of the interventions targeting students with EBD incorporated peer tutoring, while at-risk students were more often taught in small groups (two or three students).

Rivera and colleagues (2006) also noted that although behavior supports often accompanied reading interventions, not all researchers reported behavioral outcomes. Therefore, neither the effectiveness nor the necessity of the behavior support in conjunction with the reading intervention could be determined. Likewise, the impact of the behavior support component on reading skill acquisition remained unclear. Rivera and colleagues echoed the concern of other researchers that current research on reading interventions for students with and at-risk for EBD remained limited (e.g., Coleman & Vaughn, 2000; Hinshaw, 1992; Levy & Chard, 2001; Nelson, Lane, Benner, & Kim, 2011; Vaughn et al., 2001) despite a much needed increase in research focused on reading instruction for students with EBD (Kostewicz & Kubina, 2008).

In a subsequent review, Benner, Nelson, Ralston and Mooney (2010) sought to extend the work of Coleman and Vaughn (2000). Benner and colleagues (2010) identified 24 studies in an attempt to identify the effects of reading interventions on students with EBD. Benner and colleagues concluded students with EBD are responsive to reading instruction and found effect size estimates ranging from moderate to high across all studies reviewed. Additionally, Benner and colleagues noted that supplemental instruction in phonological awareness improves the reading skills of students with EBD and thus has important educational implications. Finally, Benner et al. (2010) stated that there remains a dearth of high-quality studies in this area.

Findings from past reviews indicate a paucity of research in the area of reading interventions for students with both reading and behavioral concerns (i.e., students with or at-risk for EBD). In addition, variability in the academic achievement of students with EBD, as demonstrated in the previous studies, raises questions about whether results from intervention research can be generalized to all students with EBD served in public schools (Wiley et al., 2008).

STATEMENT OF PURPOSE AND RESEARCH QUESTIONS

The variability of reading achievement among students with and at-risk for EBD is well documented (Lane et al., 2008; Nelson, Benner, Lane, et al., 2004; Reid et al., 2004; Wagner et al., 2005). Furthermore, researchers have often cited the lack of research on reading instruction/intervention for students with EBD (Benner et al., 2010; Coleman & Vaughn, 2000; Vaughn et al., 2001; Rivera et al., 2006). Rivera and colleagues (2006) stated that their review failed to find any studies that compared reading only interventions

with reading and behavior support interventions. Benner and colleagues (2010) noted that more replications of studies are needed "if we are to fully understand how to improve the literacy outcomes of students with or at risk of BD" (p.98).

This dissertation study sought to expand the literature on interventions for students with dual risk in five ways. First this study expanded on the research of Oakes, Mathur, and Lane (2010) in which the researchers investigated the impact of a multicomponent intervention on the fluency acquisition of second grade students receiving a secondary-tier reading intervention. Specifically, this study aimed to investigate the impact of the behavior support component on student behavior while simultaneously gathering fluency acquisition data, to determine if (a) the addition of the behavior component results in an increase in the rate of fluency growth above and beyond that which may occur with a reading-only intervention, and (b) if decreases in behavior correspond to increases in fluency. Second, the intervention package was implemented within a tiered intervention approach, answering the call of Benner et al. (2010) to conduct research using a multi-tiered model of support. The intervention in this study was administered as a secondary tier intervention. It addressed both the reading and behavioral needs of students with reading and behavior challenges. Third, the study participants were early elementary students, educated in a public elementary school where more than 80% of the students enrolled received free and reduced-priced lunch programs. Fourth, through a multiple baseline design, the study provided data, gathered concurrently, on fluency acquisition and behavior during a fluency-based intervention with and without the presence of a behavior support component. Finally, this study measured and report academic and

behavioral outcomes of participants identified as at-risk of reading difficulties with comorbid EBD risk or identification. The following research questions guided this dissertation study:

1. What is the effect of a targeted reading intervention on the reading skills of early elementary students identified with or at-risk for EBD?
2. What is the effect of a targeted reading intervention on the off-task behavior of early elementary students identified with or at-risk for EBD?
3. What is the effect of adding a behavioral intervention to the reading intervention on the reading performance of students with or at-risk for EBD?
4. What is the effect of adding a behavioral intervention to the reading intervention on the off-task behavior of students with or at-risk for EBD?
5. Does the addition of a behavior support component to the academic intervention (a) increase student reading performance and (b) decrease student off-task behavior at a greater rate than implementing the academic intervention alone?

Chapter 2: Review of Literature

In the following sections, a review of the literature on reading interventions for early elementary grade students (i.e., kindergarten through third grade) is presented. In this review, the researcher (a) reviewed extant research on interventions targeting the reading skills of students with or at-risk for EBD in grades K-3, and (b) summarized how the literature review informed the research design and methodology of this dissertation study in chapter 3.

INTERVENTIONS TARGETING THE READING SKILLS OF YOUNG LEARNERS WITH AND AT-RISK FOR EBD

A review of the literature was conducted to explore the effect of interventions on the reading performance of students with and at-risk for EBD in grades K-3. This review outlines the efficacy of those interventions on student reading achievement and behavioral performance (where appropriate), and reports of intervention fidelity and social validity findings.

Studies included in this review were identified through a three-step search procedure. First, an electronic search of the peer reviewed literature published between January 2000 and June 2013, was conducted using the following databases: Academic Search Complete, Education Full Text, ERIC, and PsycINFO. Keywords were searched across three fields. Electronic search terms included, *emotional disturbance*, *behavior disorder*, *behavioral, disturbance*, *challenging behavior*, *EBD; reading instruction, reading difficulties, emergent literacy, early literacy, fluency, phonics, reading comprehension, vocabulary, phonological awareness*; and, *elementary* and *primary*. Then

citations of studies appearing in reviews published between January 2000 and April 2013 (Benner et al., 2010; Nelson et al., 2011; Coleman & Vaughn, 2000; Vaughn et al., 2002; Rivera et al., 2006) were searched for additional articles that met criteria for inclusion. Finally, a hand search was conducted by reviewing the table of contents and abstracts from the following six journals: *Behavioral Disorders*, *Education and Treatment of Children, Exceptional Children, Journal of Emotional and Behavioral Disorders*, *Journal of Special Education*, and *Remedial and Special Education*. One additional study (Harris, Oakes, Lane, & Rutherford, 2009) was identified for inclusion through these hand searches.

Thirteen studies published from 2000 - 2013, with 382 participants, examined interventions that targeted reading skills of students with or at-risk for EBD in grades K-3. The majority of interventions included the use of supplementary, direct, and explicit instruction and/or programs, and/or the use of peer assisted learning strategies. All interventions targeted one or more of the five components of effective reading identified by the NRP (NICHD, 2000). For the purposes of this review, studies that met inclusion criteria are grouped by reading component measured and population targeted, in order to report study characteristics. A summary of intervention effects are presented in Tables 2.1 and 2.2. A summary of intervention components across studies for students with and a-risk for EBD are presented in Tables 2.3 and 2.4, respectively.

Table 2.1

Effect Sizes for Group Design Studies

	Effect Size by Reading Outcome Measure		
Study	Measure	Construct	Hedge's *g*
Lane, Fletcher, et al. (2007)	DIBELS (NWF)	PH	0.40
	TOPA	PA	0.71
Nelson, Benner, et al. (2005)	DIBELS (LNF)	PH	0.70
	DIBELS (ISF)	PA	0.66
	DIBELS (PSF)	PA	0.50
	DIBELS (NWF)	PH	0.94
	CTOPP (PA)	PA	1.02
	CTOPP (RN)	PA	0.60
Nelson, Stage, et al. (2005)	DIBELS (LNF)	PH	0.91
	CTOPP (PA)	PA	0.46
	CTOPP (RN)	PA	0.06
	WRMT-R (WA)	WR	0.97
	WRMT-R (WI)	RN	1.05
Walker et al. (2009)	ORF	WR	0.24
	WJ-III (LWI)	RN	-0.07

Note: DIBELS= Dynamic Indicators of Basic Literacy Skills; NWF= nonsense word fluency; TOPA= Test of Phonological Awareness; LNF= letter naming fluency; ISF= initial sound fluency; PSF= phoneme segmentation fluency; CTOPP= Comprehensive Test of Phonological Awareness; PA= phonological awareness; RN= rapid naming; WR= word reading; CBM=curriculum based measures; WRMT-R= Woodcock Reading Master Test-Revised; WA= word attack; WI= word identification; RN=Rapid Naming; WJ-III= Woodcock Johnson III Diagnostic Reading Battery; LWI= letter word identification.

Table 2.2

Percentage of Non-overlapping Data for Single Case Studies

Author	Measure (Subtest)	Construct	Individual *PND* by Reading Outcome Measure: Intervention	Maintenance
Barton-Arwood et al., (2005)	DIBELS (NWF)	PH	17.6%, 35%, 50%, 60%, 93.7%, 100%	-
	Phoneme Blending	PA	17.6%, 30%, 40%, 70.5%, 76.4%, 76.4%	-
	Phoneme Segmentation	PA	11.8%, 30%, 50%, 61.5%, 64.7%, 93.8%	-
	Word Reading	RN	30%, 41%, 80%, 88%, 92%, 100%	-
	ORF	WR	12%, 30%, 30%, 38.5%, 87.5%	-
Dawson et al., (2000)	WRCPM (CM)	RN	28.5%, 28.5%, 28.5%, 28.5%	-
	WRCPM (TM)	RN	57%, 71%, 85.7%, 100%	-
Falk & Wehby, (2001)	LSCPM	PH	66.7%, 66.7%, 83%, 85.7%, 100%, 100%	-
	BCPM	PA	0%, 33%, 33%, 33%, 75%, 100%	-
	SCPM	PA	0%, 0%, 0%, 25%, 66.7%, 90%	-

(Table 2.2. continues)

(Table 2.2 continued)

Author	Measure (Subtest)	Construct	Individual *PND* by Reading Outcome Measure	
			Intervention	Maintenance
Lane et al., (2001)	DIBELS (NWF)	PH	10%, 33%, 60%, 60%, 80%, 87%, 100%	0%, 0%, 33%, 100%, 100%, 100%, 100%
	CWPM*	WR	33%, 100%	0%, 100%
Lane, Little, et al., (2007)	DIBELS (NWF)	PH	14%, 28%, 71.4%, 71.4%, 71.4%, 85.7%, 100%	0%, 33%, 33%, 33%, 33%, 33%, 33%
	DIBELS (ORF)	WR	0%, 14%, 28.5%, 28.5%, 57%, 71%, 100%	66.7%, 66.7%, 100%, 100%, 100%, 100%, 100%
Oakes et al., (2010)	DIBELS (ORF)	WR	0%, 10%, 13%, 25%, 40%, 50%, 70%, 75%, 80%	-
Wehby et al., (2003)	NWCPM	PH	0%, 11%, 17%, 33%, 50%, 67%, 83%, 83%	-
	BCPM	PA	0%, 0%, 25%, 50%, 67%, 75%, 78%, 79%	-
	LSCPM	PA	0%, 33%, 33%, 56%, 67%, 67%, 67%, 80%	-
	SWCPM	RN	0%, 0%, 0%, 11%, 12.5%, 17%, 33%, 89%	-

(Table 2.2 continues)

(Table 2.2. continued)

Note: * denotes data calculated based on a sample of data provided. DIBELS= Dynamic Indicators of Basic Literacy Skills; NWF= nonsense word fluency; LNF= letter naming fluency; ISF= initial sound fluency; PA= phonological awareness; RN= rapid naming; ORF= oral reading fluency; WRCPM= words read correct per minute; BCPM= blends correct per minute; LSCPM= letter sounds correct per minute ; SCPM=segments correct per minute; SWCPM=sight words correct per minute; CWPM= correct words per minute; NWCPM= nonsense words correct per minute; CM= computer model; TM= teacher model; PA= phonological awareness; WR= word reading; PH= phonics; RN=rapid naming

Table 2.3

Intervention Components for Studies Including Students with EBD

Authors	Instructional Format	Setting	Interventionist	Duration, Frequency, Intensity	Academic Intervention	Behavior Intervention
Barton-Arwood et al., (2005)	Small Group Peer-Assisted	General Education	Research Staff and Peers	30 min 4 d/w 16 weeks	*Horizons Fast Track A-B* PALS	Reward Contingency Plan
Dawson et al., (2000)	One on One	Resource Room	General Education Teacher	3-6 min (per student) 3 days per week 7 sessions	Teacher Model Computer Model No Model	_____
Falk & Wehby (2001)	Peer-Assisted	General Education	General Education Teacher and Peers	3d/week 11 weeks	K-PALS	Students earned points for behavior and engagement

(Table 2.3 continues)

(Table 2.3 continued)

Authors	Instructional Format	Setting	Interventionist	Duration, Frequency, Intensity	Academic Intervention	Behavior Intervention
Wehby et al., (2003)	Small Group Peer-Assisted	General Education	Research Staff	4d/w 45 min - reading program 30 min PALS 5-8 weeks	*Open Court* PALS	_____
Wehby et al., (2005)	Whole Class Small Group	Resource Room	General Education Teacher & Research Staff	75 min 4d/w in GED 20 min/32 sessions	GED-Scott Foresman PATR	_____

Note: "____" denotes that component was not included in the study. PALS= Peer-Assisted Learning Strategy; K-PALS= Kindergarten Peer-Assisted Learning Strategy; PATR= Phonological Awareness Training for Reading.

Table 2.4

Intervention Components for Studies Including Students At-risk of EBD

Authors	Instructional Format	Setting	Interventionist(s)	Duration, Frequency, Intensity	Academic Intervention	Behavior Intervention
Harris et al., (2009)	Small Group Peer-Assisted	Resource Room	Research Staff & Peers	30 min 4 mornings/week	DI-Phonics Peer Fluency Practice	Reward Contingency Plan
Lane et al., (2001)	Small Group	Resource Room	Research Staff	30 min, 3d/w, 10 weeks (15 hours)	PATR	Independent Group Contingency Plan
Lane, Fletcher, et al., (2007)	Small group	Private Room	Paraprofessional	30 sessions 30 min, 3 days/week, 10 weeks (15 hours)	PATR	_____
Lane, Little, et al., (2007)	Peer-Assisted	General Education	General Education Teacher & Peers	30 min, 4d/w, 14 total hours	First Grade-PALS	Reward Contingency Plan
Nelson, Benner, et al., (2005)	One-on-one	NR	Research Staff	25 sessions, 10-20 min	*Stepping Stones to Literacy* supplemental tutoring	____

(Table 2.4 continues)

(Table 2.4 continued)

Authors	Instructional Format	Setting	Interventionist(s)	Duration, Frequency, Intensity	Academic Intervention	Behavior Intervention
Nelson, Benner, et al., (2005)	One-on-one	NR	Research Staff	25 sessions, 10-20 min	*Stepping Stones to Literacy* supplemental tutoring	____
Nelson, Stage, et al., (2005)	One-on-one	NR	Research Staff	25 sessions, 10-20 min	*Stepping Stones to Literacy* supplemental tutoring	____
Oakes et al., (2010)	Small Group	Resource Room	SED Staff	30 min, 4d/w 8 weeks	*Fundations* and Fluency-building	Reward Contingency Plan
Walker et al., (2009)	Individual	General education classroom; participant's home	First Step's Coach, General Education Teacher, Participants' Parents/guardians	50-60 hours, over 3 months	____	First Step to Success early intervention program (Group Contingency)

Note: a " __" denotes that component was not included in the study. NR= not reported; DI= direct instruction; PALS= Peer-Assisted Learning Strategy; K-PALS= Kindergarten Peer-Assisted Learning Strategy; PATR= Phonological Awareness Training for Reading.

PRACTICES FOR YOUNG LEARNERS IDENTIFIED WITH DUAL RISK

Fluency

Oral reading fluency is categorized by the speed, accuracy, and expression of the reader (NICHD, 2000), and builds on earlier stages of reading development (Pikulski & Chard, 2005). One group design study (Walker et al., 2009) and two single case studies (Dawson et al., 2000; Oakes et al., 2010) measured intervention effectiveness on fluency skills. Researchers administered both curriculum-based measures (CBMs) of oral reading fluency (ORF) and standardized measures.

Using an alternating treatments design, Dawson and colleagues (2000) tested the efficacy of teacher-modeled read aloud and computer-modeled read aloud, against a baseline condition of no modeled read aloud, on student oral reading fluency among students with EBD. General education teachers, in a resource room, delivered the intervention individually to students. Dawson and colleagues (2000) used a CBM of ORF to measure words read correct per minute (WRCPM; terminology is reported as cited by the researchers) across two conditions (i.e., computer-model, teacher-model) for four participants. Individual percentage of non-overlapping data (*PND*) indicated variability of effectiveness across participants. Analysis of *PND* data performance for WRCPM during the teacher model indicated that one student demonstrated results associated with very effective treatment (*PND* = 100%). Two students demonstrated results associated with an effective treatment, with *PND* scores of 71% and 85.7%. One student demonstrated performance associated with questionable intervention effectiveness, with a *PND* of 57%. During the computer model, *PND* performance was far less impressive, with four

students each demonstrating a *PND* of 28.5%. Maintenance data were not reported for either condition.

Using a cohort-model design with random assignment at the classroom level, targeted at students at-risk for EBD, Walker and colleagues (2009) implemented the *First Steps to Success* (Walker, Stiller, Golly, Kavanagh, Severson, & Feil, 1997) intervention program. The intervention program involved the coordination between, training of and implementation by a *First Steps* coach and participants' teachers and families. The intervention program required the completion of a prescribed set of activities and tasks and incorporated a reward criterion (Walker et al., 2009). Teachers and parents monitored participants' behavior. Although the intervention did not include an academic component, the researchers measured fluency using the *Woodcock Johnson III* (WJ-III; Woodcock, Mather, Schrank, 2004) letter-word identification subtest (*LWI*) and a CBM of ORF (Walker et al., 2009). Effect sizes (*ES*) across both measures of fluency indicated less than modest effects. Data for the CBM measure yielded an *ES* of 0.24 and the WJ-III *LWI* subtest yielded an *ES* of 0.07. The researchers also included measures of behavior (i.e., academic engaged time [AET]). It appeared that students demonstrated large overall gains, when compared to the control group at posttest across all behavior domains assessed (i.e., direct observation of AET using teacher and parent rating scales; Walker et al., 2009).

Using a multiple-baseline across groups design targeting students at-risk for EBD, Oakes and colleagues (2010) implemented an intervention consisting of academic and behavioral components implemented by a reading specialist in a resource room. The

intervention was delivered to two small groups, a reading risk only group and a reading and behavior risk group. The intervention consisted of three phases: (a) reading accuracy and behavior support (A/BS); (b) A/BS plus fluency-building (A/BS + F); and, (c) a return to A/BS. The A/BS phases consisted of (a) direct instruction in phonics skills using the *Fundations: Wilson Language Basics for K-3* (Wilson, 2000); (b) a response-cost contingency plan, in which students were rewarded with points for various behaviors, such as completing an assignment, raising his/her hand, and waiting his/her turn; and (c) a ten minute read aloud. During the A/BS + F phase, the 10 minute read aloud was replaced with fluency practice using the *Voyager's Blastoff to Reading* (Voyager Expanded Learning, 2004) program.

Oakes et al. (2010) measured fluency using the *Dynamic Indicators of Basic Early Literacy Skills* (DIBELS) ORF measure. Individual *PND* results were variable across participants. During the intervention phase, the majority of students (n = 5) demonstrated *PND* results associated with an ineffective treatment with *PND* scores of 0%, 10%, 13%, 25%, and 40%. For three students, *PND* results were associated with an effective treatment, with *PND* scores of 70%, 75%, and 80%, while one student demonstrated questionable effectiveness results (*PND* = 50%). *PND* was also calculated during the reversal phase. For three students, reversal to baseline resulted in performance associated with an increase from intervention, with *PND* scores of 50%, 50%, 67%. For six students, performance during the reversal phase resulted in decreases from intervention, with *PND* scores of 0%, 0%, 0%, 13%, 67%, and 75%, respectively.

Overall, students with dual reading and behavioral risk outperformed students with reading-risk only.

Of the three intervention studies measuring only fluency skills, findings yielded variability in student performance across measures. Reading interventions included read aloud modeling (Dawson et al., 2000) and direct instruction in phonics and fluency-building practice (Oakes et al., 2010). Two studies included behavior supports/interventions (Oakes et al., 2010; Walker et al., 2009), though neither of the studies included behavior outcome measures. Fidelity of implementation was reported and exceeded 80% in two studies (Oakes et al., 2010; Walker et al., 2009).

Fluency and Phonics

As previously noted, fluency pertains the speed, accuracy, and expression of the reader (NICHD, 2000). Phonics instruction stresses the acquisition of letter-sound correspondences and their use in reading and spelling (NICHD, 2000). According to the NRP, the primary focus of phonics instruction is to (a) understand letter-sound correspondences and spelling patterns, and (b) apply this knowledge to word reading (NICHD, 2000). Three single case design studies (Lane et al., 2001; Lane, Little, et al., 2007; Harris et al., 2009), employed multiple-baseline designs, and measured intervention effectiveness on both fluency and phonics skills. Fluency was measured using the DIBELS ORF in two studies (Lane, Little, et al., 2007; Harris et al., 2009). One study utilized a fluency CBM of correct words read per minute (CWPM; Lane et al., 2001). Phonics was measured across all studies using the DIBELS nonsense word fluency (NWF) measure.

Lane and colleagues (2001) implemented the *Phonological Awareness Training for Reading* (PATR; Torgensen & Bryant, 1994a), using a multiple-baseline across small groups (i.e., 4 to 6 students) targeting students at-risk for EBD. The PATR included rhyming, sound blending and segmenting, reading, and spelling tasks. In addition to the academic component, researchers also implemented an independent group contingency plan in which students were rewarded with points for various behaviors, such as completing an assignment, raising his/her hand, and waiting his/her turn. Points could then be exchange for small prizes daily, weekly, or when a predetermined number of points were accumulated).

Lane and colleagues (2001) measured intervention effectiveness on fluency using a CBM of CWPM. Percentage of non-overlapping data was calculated based on data provided for two students. Individual *PND* scores indicated variability of effectiveness, with *PND* scores of 100% (very effective) and 33% (ineffective). Maintenance data demonstrated similar variability, with individual *PND* scores of 100% (very effective) and 0% (ineffective), respectively.

Lane et al. (2001) measured phonics performance using the DIBELS NWF measure. Performance data presented for the seven participants indicated variability of intervention effectiveness across participants. Of these seven students, two students demonstrated results associated with a questionable intervention effect, each with *PND* scores of 60%. Two students demonstrated performance associated with an effective intervention, with *PND* scores of 80% and 87%. One student demonstrated results associated with a very effective intervention (*PND* = 100%). For two students, results

were less impressive, with *PND* scores of 10% and 33%. Follow-up data indicated equally variable results across participants, with four students sustaining gains noted during the intervention phase. An additional four students demonstrated results associated with a very effective treatment, (*PND* = 100%). For the remaining three students, performance results indicated an ineffective treatment, with *PND* scores of 0%, 0%, and 33%.

Lane, Little and colleagues (2007) implemented the *First-grade Peer-Assisted Learning Strategies* (First-grade PALS; Fuchs, Fuchs, Mathes, & Simmons, 1997), using a multiple-baseline across classrooms design with students at-risk for EBD. The researchers implemented a peer-directed, structured reading program that targeted decoding and reading fluency skills as a supplement to students' core reading instruction (Lane, Little, et al., 2007). During the study, a reward contingency plan, similar to the one used by Lane et al. (2001) was also implemented. General education teachers served as interventionists, with the intervention administered in the general education classroom. Intervention effectiveness was measured using DIBELS ORF for fluency and DIBELS NWF for phonics.

Intervention ORF data appeared variable across participants. During the intervention phase, performance data for four students indicated an ineffective treatment, with *PND* scores of 0%, 14%, 28.5%, and 28.5%. Three students' performance data resulted in *PND* scores that evidenced a range of treatment effectiveness, with one student in the questionable range (*PND* = 57%), one in the effective range (*PND* = 71%), and one in the very effective range (*PND* = 100). Similarly to individual performance

during intervention, results during maintenance were variable. Two students demonstrated performance results associated with a questionable treatment, both with *PND* scores of 66.7%. During maintenance, five students demonstrated performance data associated with a very effective intervention, all with *PND* scores of 100%.

Lane, Little, and colleagues (2007) also administered the DIBELS NWF as a measure of phonics skills. Results were less impressive than with the ORF measure, overall. During the intervention phase, individual student performance resulted in *PND* scores associated with ineffective (14%, 28%), effective (71.4%, 71.4%, 71.4%, 85.7%) and very effective (100%) intervention effects. Similarly, maintenance performance resulted in *PND* scores associated with a range of treatment effectiveness. Performance increased during the maintenance phase for five students, but remained associated with an ineffective intervention for one student (*PND* = 33%). During maintenance, the remaining two students' performances demonstrated decreases from intervention both with *PND* scores associated with an ineffective intervention (*PND* = 0%, 33%).

Lane, Little and colleagues (2007) also explored the impact of the intervention on student academic engagement. As with academic performance, findings were variable across participants. A ceiling effect may have been evident, as all students demonstrated at least one baseline data point of academic engaged time at 100%. When considering the lowest point during baseline, performance resulted in *PND* scores associated with a range of effectiveness. Three students demonstrated results associated with an effective intervention during intervention (*PND* = 71%, 71%, 85.7%). During maintenance one student demonstrated performance associated with a questionable intervention (*PND* =

67%). One student demonstrated performance associated with an effective intervention, with a *PND* score of 71%. Performance was associated with a very effective intervention during the intervention phase for four students and for five students during maintenance, all with *PND* scores of 100%.

Harris and colleagues (2009) implemented a supplemental, multicomponent intervention to target phonics and fluency among students at-risk for EBD, with either internalizing (IR) or externalizing (ER) risk profiles. Researchers used an explicit instruction reading program (i.e., the *Sonday System*; Sonday, 1997) for phonics instruction. A peer-assisted learning strategy, incorporating repeated readings of *Great Leaps* (Campbell, 1998) passages, was implemented to address fluency. Researchers and project staff served as interventionists and delivered the intervention to small groups of students (i.e., two groups of four) in a resource room. In addition to the academic components, a response-cost behavioral system was implemented during intervention. Intervention effectiveness was measured using DIBELS ORF for fluency and DIBELS NWF for phonics.

Harris et al. (2009) reported performance data on the ORF measure for eight participants. Individual *PND* scores indicated variability of effectiveness across participants. Three students demonstrated *PND* scores associated with a questionable intervention, each with a *PND* score of 66%. One student demonstrated performance data associated with an effective intervention (*PND* = 75%). Performance data indicated a very effective intervention for three students, all with *PND* scores of 100%. For one student, results were less impressive (*PND* = 33%). Maintenance data were reported for

six participants, with all students demonstrating performance data in the very effective range (all with *PND* scores of 100%). Students with internalizing (IR) and externalizing (ER) risk profiles performed similarly: three students with IR and three students with ER performed in the questionable range, and one student with IR and one student with ER performed in the very effective range.

Similarly, Harris and colleagues (2009) reported performance data on the DIBELS NWF measure for eight participants, with performance data associated with variability of effectiveness across participants. Three students demonstrated performance associated with *PND* scores in the questionable range (*PND* = 66%, 66%, 66%). One student demonstrated performance associated with an effective intervention, with a *PND* score of 75%. Performance data indicated a very effective intervention for three students, each with a *PND* of 100%. For one student, results were less impressive (*PND* = 33%). Maintenance data were less variable. Five students demonstrated maintenance results associated with a very effective treatment, each with a *PND* of 100%. Two of the five students with maintenance *PND*s of 100% demonstrated increases from intervention (*PND* = 66%, 75%). Although results were still associated with a questionable treatment, performance data during maintenance (*PND* = 50%) indicated a decrease from intervention *PND* (66%) for one student. Slight variability in performance among students with IR and ER was noted. Amongst students with IR, one student performed in the ineffective range, one in the questionable range, and one in the very effective range. Amongst students with ER, two students performed in the questionable range and two performed in the very effective range.

Of the three studies (Lane et al., 2001; Lane, Little, et al., 2007; Harris et al., 2009), employed multiple-baseline designs measuring intervention effectiveness on both fluency and phonics skills, reading performance was variable across participants. All three studies included a response-cost contingency for behavioral support. One study included behavioral outcome measures (Lane, Little, et al., 2007), and found variability across participants similar to reading performance. All interventions included opportunities for direct, explicit instruction in phonics skills. One study included peer assisted learning strategies (Lane, Little, et al., 2007). Two studies included fluency skills development (i.e., repeated readings; Harris et al., 2009; Lane, Little, et al., 2007). Fidelity of implementation was reported in two studies (Harris et al., 2009; Lane, Little, et al., 2007) and exceeded 80% in both studies.

Phonological Awareness and Phonics

Phonological awareness (PA) focuses on the sound elements of spoken words. PA is a broader term, and encompasses phonemic awareness. PA involves the identification and manipulation of larger parts of spoken language, whereas phonemic awareness involves teaching children to identify and manipulate phonemes (the smallest units of spoken language) in spoken syllables and words (NICHD, 2000). For the purpose of this review, studies were considered to address PA if the outcome measure assessed PA and/or phonemic awareness skills. As previously noted, phonics instruction stresses the acquisition of letter-sound correspondences and their use in reading and spelling (NICHD, 2000). Two group design studies (Nelson, Benner, et al., 2005; Lane, Fletcher, et al., 2007) and two single case studies (Falk & Wehby, 2001; Wehby et al., 2005)

measured intervention effectiveness on PA and phonics skills. Researchers administered CBMs and standardized measures.

Falk and Wehby (2001) implemented the *Kindergarten Peer-Assisted Learning Strategies* (K-PALS), in the general education classroom, using a multiple-baseline design across tutoring pairs targeting students with EBD. The K-PALS strategy focused on the study participants, but was used class-wide, by the general education teacher. Teachers provided explicit instruction in sound play and decoding activities for 10 to 25 minutes, three days a week. Following the teacher-directed activities, students worked in pairs on decoding activities. Peer sessions lasted for 20 to 25 min, during which time students could earn points for behavior and engagement. Researchers did report the function of the points (e.g., response-cost contingency, token economy). Falk and Wehby (2001) reported data for six participants using PA CBMs of blending and segmenting, and a phonics CBM of letter-sounds correct per minute (LSCPM).

Participant performance data on the blending CBM varied across participants. Four participants demonstrated performance data associated with an ineffective intervention, with *PND* scores of 0%, 33%, 33%, and 33%, respectively. One student demonstrated performance associated with an intervention that was effective (*PND* = 75%), while another student's performance was associated with a very effective intervention (*PND* = 100%). Similarly to the blending CBM, the segmenting CBM yielded performance results with four students with *PND* scores in the ineffective range (*PND* = 0%, 0%, 0%, and 25%); one in the questionable range (*PND* = 66.7%); and, one in the very effective range (*PND* = 90%). Student performance on the LSCPM CBM was

also variable across participants. Two students performed in the questionable range, both with *PND* scores of 66.7%. Two students performed in the effective range, with *PND* scores of 83% and 85.7%, respectively. Two students demonstrated *PND* scores of 100%, which indicated that the intervention was very effective for them. Across all three measures administered, performance data indicated that students performed better on the LSCPM measure.

Nelson, Benner, and colleagues (2005) implemented a research-based program (i.e., *Stepping Stones to Literacy*; Nelson, Cooper, & Gonzalez, 2004) involving the implementation of scripted lessons in a one-on-one setting, to kindergarteners at-risk for EBD. The intervention was designed to target six pre-reading skills: (a) identification, manipulation and memory of sounds; (b) letter names; (c) sentence meanings; (d) phonological awareness; (e) phonemic awareness; and (f) rapid naming (Nelson, Benner et al. 2005). Project staff implemented the intervention with students. Researchers administered the *Comprehensive Test of Phonological Processing* (CTOPP) PA and rapid naming (RN) subtests, and the DIBELS ISF and phoneme segmentation fluency (PSF) subtests, as PA measures. The DIBELS LNF and NWF subtests were administered as phonics measures.

ES estimates indicated results ranging from moderate to large across phonics and PA measures. Large effects were demonstrated on the (a) CTOPP PA (*ES* = 1.02), and (b) DIBELS NWF measure (*ES* = 0.94). Moderate effect sizes were demonstrated on the (a) DIBELS ISF (*ES* = 0.66), (b) CTOPP RN (*ES* = 0.60, (c) DIBELS LNF (*ES* = 0.70), and (d) DIBELS PSF (*ES* = 0.50).

Wehby and colleagues (2005) implemented the *Scott Foresman* reading program, as the core reading program, in combination with the *Phonological Awareness Training for Reading* (PATR; Torgensen & Bryant, 1994a) program. The researchers used a multiple-baseline design across groups. For the purpose of the study, participants were re-integrated into the general education setting, from a self-contained classroom that served students with EBD, for part of the primary reading component (*Scott Foresman* reading program instruction). Participants were then instructed in the special education classroom for the PATR component. General education teachers implemented the primary reading program to the whole class. During the PATR component of the intervention, students were instructed in small groups. Student performance was measured using the DIBELS Initial Sound Fluency (ISF) subtest as a PA measure, and the DIBELS NWF and Letter-Naming Fluency (LNF) subtest as phonics measures.

Although individual student performance indicated that for three students the intervention was ineffective (*PND* = 11%, 22%, 44%), one student demonstrated performance associated with an effective intervention (*PND* = 76%). Two students demonstrated maintenance performance data associated with a very effective intervention, both with *PND* scores of 100%. This was an increase for both students from intervention performance, where intervention *PND* scores were 76% and 44%, respectively. Two students demonstrated maintenance performance data associated with an ineffective intervention, with *PND* scores of 0% and 33%.

Measures of phonics performance indicated more promising results, than on the PA measure. Student performance on the DIBELS LNF measure varied across

participants. Two students demonstrated performance resulting in individual *PND* scores associated with a questionable intervention (*PND* = 63%, 67%). For two students, performance data indicated results associated with an effective intervention, both with *PND* scores of 78%. At maintenance, *PND* scores (*PND* = 100%, 100%, and 100%) were associated with a very effective intervention for three students. The *PND* score for one student was less impressive, in the questionable range (*PND* = 50%). As with other measures, individual performance on the NWF measure indicated a more effective intervention for some students, while others performed less impressively. One student demonstrated performance associated with a very effective intervention (*PND* = 100%). Another student demonstrated performance associated with an effective intervention (*PND* = 89%). For two students, performance data were less impressive, with *PND* scores of 22% and 33%, respectively. Maintenance data indicated variability across students. For two students the intervention was very effective, both with *PND* scores of 100%. One student demonstrated maintenance *PND* of 66.7%, associated with a questionable intervention. One student demonstrated less impressive results, with a *PND* of 0%.

Lane, Fletcher and colleagues (2007) implemented the PATR three days a week for 30 min per session, as a supplement to the primary reading curriculum with students at-risk for EBD. The researchers utilized a group experimental design, with random assignment to an intervention or delayed-intervention control groups. Students assigned to the intervention group were then randomly assigned to one of three groups of four. The intervention was administered by one paraprofessional in a private room adjoining the participants' classrooms.

Lane, Fletcher and colleagues (2007) administered the Test of *Phonological Awareness* (TOPA; Torgesen & Bryant, 1994b) and the DIBELS NWF measures. Effect size calculations yielded moderate effects on the TOPA (*ES* = 0.71) and the modest effects on the DIBELS NWF (*ES* = 0.40). In addition to measures of academic performance, Lane, Fletcher and colleagues measured the impact of the intervention on behavior (i.e., negative social interaction using parent and teacher ratings). Although findings were not significant across behavior measures, participants in the control group slightly outperformed students in the intervention group.

Although researchers measuring PA and phonics implemented a range of specific interventions, all interventions included direct, explicit instruction in PA and phonics skills. Two studies included the PATR (Lane, Fletcher, et al., 2007; Wehby et al., 2005). One study implemented peer assisted learning strategies (Falk & Wehby, 2001). Across all single case design studies reporting PA and phonics outcome measures, student performance on reading measures was variable. Likewise, student performance in group design utilizing PA and phonics outcome measures studies demonstrated *ES* estimates that ranged from modest to large (Lane, Fletcher, et al., 2007; Nelson, Benner, et al., 2005). One study included a behavioral incentive, though it was not fully described (Falk & Wehby, 2001). Although results did not approach significance, one study included a behavioral outcome measure, (Lane, Fletcher, et al., 2007). Fidelity of implementation was reported in all four studies. Fidelity scores reported ranged from 71.43% to 100% across intervention phases/components; with reported mean intervention fidelity scores exceeding 90% across all studies.

Fluency, Phonological Awareness, and Phonics

One group design (Nelson, Stage, et al., 2005) and two single case design (Wehby et al., 2003; Barton- Arwood et al., 2005) studies used measures of fluency, PA and phonics skills to assess intervention effectiveness. Fluency measures included the *Woodcock Reading Mastery Test-Revised* (WRMT-R; Woodcock, 1998) Word Identification (WI) and Word Attack (WA) subtests (Nelson, Stage, et al., 2005) and CBMs of word reading (Walker et al., 2003; Barton-Arwood et al., 2005). Phonological awareness measures included the CTOPP PA and RN subtests (Nelson, Stage, et al., 2005) and CBMs of blending (Wehby et al., 2003; Barton-Arwood et al., 2005), LSCPM (Wehby et al., 2003) and segmenting (Barton-Arwood et al., 2005). Phonics measures included the DIBELS LNF (Nelson, Stage, et al., 2005), DIBELS NWF (Barton-Arwood et al., 2005), and a CBM of nonsense words correct per minute (NWCPM; Walker et al., 2003).

Wehby and colleagues (2003) implemented a modified version of the kindergarten and first grade *Open Court Reading* (Adams et al., 2000) curriculum, along with a peer-mediated strategy (i.e., *Peer Assisted Learning Strategies* [PALS]) in a multiple-baseline design across groups with students with EBD. Each group consisted of two pairs of students. The intervention was implemented in the general education setting, by researchers and project staff. Students received 45 min of explicit instruction, four days a week. Kindergarten and first grade students received instruction in phonemic awareness, phonics, and comprehension, with first graders receiving additional instruction in dictation/spelling.

Wehby and colleagues (2003) included one fluency measure: a CBM of sight words correct per minute (SWCPM). Performance data for eight participants were calculated. Individual student performance indicated, that for the majority (n = 7) the intervention was ineffective, with *PND* scores of 0% (n = 3), 11%, 12.5%, 17%, and 33%, respectively. One student demonstrated performance data that indicated an effective intervention (*PND* = 89%). No maintenance data were reported for the SWCPM CBM. Individual performance varied on both the phonological awareness measures (i.e., blending and LSCPM). On the blending measure, three students demonstrated performance associated with an effective intervention (*PND* = 75%, 78%, 89%), while two students demonstrated performance associated with a questionable intervention (*PND* = 50%, 67%). Three students demonstrated less impressive performance (*PND* = 0%, 0%, 25%). Individual performance on the LSCPM measure indicated that for four students the intervention was questionable (*PND* = 56%, 67%, 67%, 67%). Three students demonstrated performance associated with an ineffective intervention, with *PND* scores of 0%, 33%, and 33%, respectively. For one student, performance was associated with an effective intervention (*PND* = 80%). Maintenance data were not reported across PA measures.

As with other measures, individual performance data on the NWCPM measure indicated that the intervention effectiveness was variable. Performance indicated a questionable intervention for two students (*PND* = 50%, 67%), and an effective intervention for two students (*PND* = 83%). Performance data indicated an ineffective intervention for four students, with *PND* scores of 0%, 11%, 17%, and 33%.

Wehby and colleagues (2003) collected performance data on two behaviors: percentage of time a student attended during instruction (ADI) and frequency of total inappropriate behavior (TIB). Intervention effects were not significant across behavioral performance. The percentage of ADI was variable across students, with mean increases noted for half of the participants. Little change was noted for the frequency of TIB across all participants. All students demonstrated at least one data point at zero TIB during baseline, with variability noted across participants throughout intervention.

Using a multiple-baseline across groups design, Barton-Arwood and colleagues (2005) implemented the *Horizons Fast Track A-B* reading program (Engelmann, Engelmann, & Davis, 1997) along with a peer-mediated strategy (i.e., PALS) targeting students with EBD. The academic intervention replaced the baseline reading instruction. The *Horizons* program was implemented separately from PALS, but at a consistent time throughout the day. The *Horizons* program consisted of direct instruction in letter sounds, phonemic awareness, word and story reading, comprehension, letter printing, spelling and sentence writing (Barton-Arwood et al., 2005). In addition to an academic component, the researchers included a behavioral component involving a contingency plan, in which students were rewarded with points for various behaviors, such as completing an assignment, raising his/her hand, and waiting his/her turn. Points could then be exchanged for small prizes. The intervention was administered in the general education setting, by researchers and project staff. Barton-Arwood and colleagues (2005) measured (a) fluency using CBMs of ORF and word reading, (b) phonological awareness using CBMs of blending and segmenting, and (c) phonics using the DIBELS NWF.

The researchers measured intervention effectiveness using two CBMs of fluency: word reading and ORF. Individual student performance varied on the word reading measure, with the majority (n = 4) of students demonstrating performance associated with an effective intervention. Two students demonstrated performance associated with a very effective intervention (*PND* = 92%, 100%). Two students demonstrated performance associated with an effective intervention, with *PND* scores of 80% and 88%, respectively. Two students demonstrated less impressive word reading performance (*PND* = 30%, 41%). Although individual performance varied across participants on the ORF measure, individual results were less impressive than word reading performance. Four students demonstrated performance associated with an ineffective intervention, with *PND* scores of 12%, 30%, 30%, and 38.5%. One student demonstrated performance associated with an effective intervention (*PND* = 87.5%).

Similarly, phonological awareness performance varied across participants. Three students demonstrated performance associated with an effective intervention on the blending measure (*PND* = 70.5%, 76.4%, 76.4%), and three students demonstrated performance associated with an ineffective intervention (*PND* = 17.6%, 30%, 40%). Similarly to blending performance, segmenting data varied across participants. One student demonstrated performance associated with a very effective intervention (*PND* = 93.8%). Three students demonstrated performance associated with a questionable intervention, with *PND* scores of 50%, 61.5%, and 64.7%. Two students demonstrated less impressive performance on the segmenting measure (*PND* = 11.8%, 30%).

Performance on the DIBELS NWF measure indicated that for two students the intervention was very effective (*PND* = 93.7%, 100%). Two students demonstrated performance associated with a questionable intervention (*PND* = 50%, 60%). Performance was less impressive for two students (*PND* = 17.6%, 35%).

Barton-Arwood and colleagues (2005) also measured student behaviors, to include: total disruptive behavior (TDB; i.e., negative talk and aggressive behaviors) and engagement. Findings indicated variability in TDB, with some groups demonstrating decreases and others remaining similar across phases. Similarly to the finding regarding TDB, engagement data were inconsistent across participants.

Nelson, Stage and colleagues (2005) implemented the *Stepping Stones to Literacy* (Nelson, Cooper, & Gonzalez, 2004) as a supplement to the primary reading instruction, which involved the implementation of scripted lessons in a one-on-one setting, to kindergarteners at-risk for EBD. The intervention was designed to target six pre-reading skills: (a) identification, manipulation and memory of sounds; (b) letter names; (c) sentence meanings; (d) phonological awareness; (e) phonemic awareness; and (f) rapid naming (Nelson, Benner et al. 2005). Project staff implemented the intervention to students. Researchers administered the WRMT-R WA and WI subtests as measures of fluency; the *Comprehensive Test of Phonological Processing* (CTOPP; Wagner, Torgesen, & Rashotte, 1999) PA and rapid naming (RN) subtests as a measure of PA; and the DIBELS LNF subtest as a phonics measures.

Effect size estimates indicated results ranging from less than modest to large across all measures. Large effects were demonstrated on the (1) WRMT-R WA (*ES* =

0.97), (2) WRMT-R WI (*ES* = 1.05), and (3) DIBELS LNF (*ES* = 0.91). Modest effect sizes were demonstrated on the CTOPP PA (*ES* = 0.46). Less than modest effects were demonstrated on the CTOPP RN (*ES* = 0.06).

In addition to academic performance, Nelson, Stage and colleagues (2005) measured the impact of intervention on social behavior. The researchers found greater gains among control group participants. Effect sizes on the Behavioral and Emotional Rating Scale (BERS; Epstein & Sharma, 1998) subtest measures of social behavior were, (1) School Functioning (*ES* = -1.48), (2) Interpersonal (*ES* = -0.97), and (3) Intrapersonal (*ES* = -1.45).

Of the three studies reporting fluency, PA, and phonics outcomes, all researchers implemented a range of supplemental academic interventions (i.e., *Open Court*, *Horizons*, *Stepping Stones*). All interventions included direct, explicit instruction in PA and phonics skills. Two studies included the PATR (Lane, Fletcher, et al., 2007; Wehby et al., 2005). One study included peer-mediated strategies (i.e., PALS; Barton-Arwood et al., 2005). One study implemented the PALS peer-assisted learning strategy (Falk & Wehby, 2001). Across all single case design studies reporting, student performance on reading measures was variable. Likewise, student performance in the group design study demonstrated *ES* estimates that ranged from less than modest to large (Nelson, Stage, et al., 2005). Although one study included a response-cost contingency behavioral component (Barton-Arwood et al., 2005), all three studies reported behavioral outcomes. Findings regarding behavior outcomes were inconclusive across studies, with participants demonstrating variability in performance. In one study (Nelson, Stage, et al., 2005),

control participants outperformed intervention participants on all behavior measures. All studies reported fidelity of implementation ranging from 70% to 100% across intervention phases/components; mean intervention fidelity scores exceeded 90% across all studies.

Implications of Extant Literature for Developing a Dissertation Study

The need to identify effective interventions for students in early elementary grades is echoed by the federal mandate to have all students reading by third grade (NCLB, 2001). The bleak reading outcomes identified for young students with EBD (Wagner et al., 2005) make identifying such interventions an imperative. Despite the paucity of research identified in this review, the studies reviewed presented several interventions that (a) targeted an array of early reading domains, including fluency, phonics, phonological and phonemic awareness; (b) were comprised of a variety of instructional strategies, to include, direct instruction and peer-mediated approaches; and, (c) resulted in variability in the reading achievement of some early elementary grade students with and at-risk for EBD.

Similarly to the findings of Benner and colleagues (2010), the findings from this review indicated that, to varying degrees, early elementary grade students with and at-risk for EBD are receptive to interventions targeting early reading skills. Intervention effectiveness varied across studies and participants. Specifically, *ES* estimates varied from less than modest to large across all group studies.

Findings from this review indicated that interventions were less effective student fluency skills than phonological awareness or phonics skills. These findings should be

interpreted with caution. Among students with and at-risk for EBD, such gains in ORF may be considered practically significant when accounting for the reported underachievement typical of this population (Wagner et al., 2005). Yet, students in kindergarten through 2nd grade are "learning to read" (Chall, 1983, 1996), which includes developing their phonological awareness and phonics skills. Fluency tends to be a reading domain that is developed toward the end of 2nd grade through later elementary grades.

Findings from this review indicated that more studies targeting students at-risk for EBD included behavioral supports than studies targeting students with EBD. Despite this finding, behavioral outcomes were not reported in all studies that included behavior support components. In some cases, behavioral outcomes were measured and reported in studies that did not include such supports (e.g., Wehby et al., 2003).

As evidenced by this review, few studies addressed the reading and behavior needs of young students with or at-risk for EBD. Landrum et al. (2004) noted that interventions currently validated with students displaying different learning, behavioral or social problems that are typical of the EBD population can be used with this population; though future research is needed to validate the efficacy of such interventions among the EBD population. Replication of previously successful studies, especially those using single subject design methods are needed to strengthen, validate, and support generalization across the EBD population. Given the academic and behavioral needs of students with EBD, research should include reading interventions with behavioral supports (Hinshaw, 1992; Landrum et al., 2003; Levy & Chard, 2001; Mooney et al.,

2004; Vannest et al., 2009) to measure the effect on reading and behavioral growth of students with these comborbid concerns. Researchers may wish to concurrently measure behavior and reading skills acquisition through frequent probes, which are a necessary component of progress monitoring.

This dissertation study addressed both the academic (i.e., reading) and behavioral needs of students with and at-risk for EBD through the implementation of a multicomponent intervention. Incorporating a multiple baseline design, this study investigated the impact of the behavior support component on student behavior while simultaneously gathering fluency acquisition data, to determine if (a) the addition of the behavior component results in an increase in the rate of fluency growth above and beyond that which may occur with a reading-only intervention, and (b) if decreases in behavior would be noted as fluency acquisition increased.

Chapter 3: Method

This dissertation study sought to expand the literature on interventions for students with reading and behavioral challenges. The following research questions guided the study.

1. What is the effect of a targeted reading intervention on the reading skills of early elementary students identified with or at-risk for EBD?
2. What is the effect of a targeted reading intervention on the off-task behavior of early elementary students identified with or at-risk for EBD?
3. What is the effect of adding a behavioral intervention to the reading intervention on the reading performance of students with or at-risk for EBD?
4. What is the effect of adding a behavioral intervention to the reading intervention on the off-task behavior of students with or at-risk for EBD?
5. Does the addition of a behavior support component to the academic intervention (a) increase student reading performance and (b) decrease student off-task behavior at a greater rate than implementing the academic intervention alone?

The following sections detail the method for this dissertation study. A description of the setting and research participants is provided. In addition, an alignment of the study with the current Institute of Education Sciences (IES) guidelines and quality indicators for single case research is presented. The following sections also include descriptions of the research design, procedures, and data analysis.

RESEARCH DESIGN

A multiple baseline across participants (A-B-C; Kennedy, 2005) design was implemented. This design allowed for conclusions to be drawn about possible functional relationships between the A-B (baseline – fluency-building) and B-C (fluency-building – TSG-mod) components of the study (Kennedy, 2005). This design also allowed each participant to serve as his or her own control with the use of a baseline phase, accounting for most concerns regarding internal validity, including maturation and history (Horner et al., 2005). In addition, this design allowed for functional relationships to be demonstrated if consistent changes in outcome levels occur following the introduction of the independent variable with each successive participant (Horner et al., 2005). Although ORF rates are not expected to return to baseline level, a multiple baseline design allowed for slope analysis, within and across phases and participants, to analyze changes in rate of progress (see Oakes, 2009).

IES GUIDELINES AND QUALITY INDICATORS FOR SINGLE CASE RESEARCH

Several components of the dissertation study's design and implementation were influenced by a technical report developed for the IES (i.e., the Single-Case Design Technical Documentation; Kratochwill et al., 2010), which outlined guidelines and quality indicators for single case design (SCD) research. The following sections highlight the four major sections of the technical report (Kratochwill et al., 2010) and the alignment of this dissertation study with each section.

Research Questions

The IES document is clear in specifying that SCD studies attempt to determine if the intervention condition(s) are more effective than baseline conditions (i.e., *business-as-usual*). Furthermore, SCD studies seek to determine a functional relationship between the independent and dependent variables (Kratochwill et al., 2010). The multiple baseline design utilized allowed for conclusions to be drawn regarding a functional relationship between the introduction of the intervention and a change in the participant's reading and behavior performance (Kratochwill et al., 2010). The researcher monitored conditions during baseline, and also during intervention phases, as the intervention was intended to be supplemental to the baseline condition. Such observations were necessary to ensure consistency of the baseline condition across phases, to ensure that the intervention phases did not replace but rather supplemented the core (baseline) reading instruction. Both intervention phases were equivalent in intervention time, materials, direct, explicit instruction, and intensity (with the exception of the addition of a behaviorally intensive intervention component in phase C). Furthermore, repeated measurement of conditions established a pattern of participant response across conditions.

Threats to Internal Validity

Enhancement of internal validity of SCD research is possible through the replication of experimental effect, with three or more replications at different points in time considered the minimum standard (Horner et al., 2005; Kratochwill et al., 2010). Additional threats to internal validity include history, maturation, and changes in instrumentation. This dissertation study attempted to account for potential threats to

internal validity by including a minimum of three data points per participant per phase, with replications of experimental effect across participants and phases. In addition, data were analyzed within and between phases, and across participants.

Design Standards

The primary goal of SCD research is to establish a functional relationship between a manipulated independent variable and a change in the dependent variable (Kratochwill et al., 2010). To demonstrate this *experimental control*, a method of staggering the independent variable across different points in time with different cases (e.g., participants) should be used (Kratochwill et al., 2010). In an attempt to demonstrate the aforementioned *experimental control,* this dissertation study used a multiple baseline design with at least three attempts to demonstrate an intervention effect at three different points in time (e.g., across participants).

A precise description of conditions and the independent variable such that replication can be conducted is essential (Kratochwill et al., 2010). During this dissertation study, the repeated observations of the baseline condition were conducted in an effort to accurately report the condition. The independent variable and intervention phases were monitored to ensure that an accurate description of the intervention and conditions were presented for future replication. In addition to condition and independent variable descriptions, the measurement of fidelity of implementation and social validity (Horner et al., 2005) are additional design standards that influenced this dissertation study. This dissertation study included repeated measures of fidelity of implementation

across study phases, and the administration of social validity measures across teachers and participants.

Additional design standards include (a) adequate descriptions of study participants, and (b) systematic measurement of dependent variables. This dissertation study allowed for a comprehensive assessment of and description of study participants, through (a) the administration of academic and behavioral screening measures and (b) student records reviews (e.g., office discipline referrals, Individualized Education Programs). This dissertation study attempted to account for the systematic measurement of dependent variables through reading measures administered weekly across all study phases, and weekly observations of student behavioral performance.

Data Analysis

The IES guidance document recommended detailed visual analysis to determine (a) the existence of a relationship between the independent variable(s) and the dependent measures; and (b) the strength of that relationship (Horner et al., 2005; Kennedy, 2005; Kratochwill et al., 2010). As previously noted, this dissertation study utilized a multiple baseline design with at least three attempts to demonstrate an intervention effect across three different points in time. In addition, phase changes only occurred after a minimum of three data points indicated a predictable, *stable*, pattern of performance (Kratochwill et al., 2010) or a "contra-therapeutic" trend (see *Chapter 3: Procedures: Baseline: Phase A*) following at least three data points is evident.

The IES guidance document further detailed six features of within and between phases visual analysis, including: "(1) level, (2) trend, (3) variability, (4) immediacy of

the effect, (5) overlap, and (6) consistency of data patterns across similar phases" (Kratochwill et al., 2010, p. 18). This dissertation study included an approach to data analysis (see *Chapter 3: Data Analysis*) that accounted for all six features of data analysis.

SETTING AND PARTICIPANTS

This dissertation study was conducted in a residential, public charter school that served students in kindergarten through 5th grade. The campus was part of a large, urban public school district in a large southwestern city. More than 80% of students qualified for or received free or reduced lunch. At the time this study began, school administration was in the process of developing and implementing a Response to Intervention framework for the campus. The study intervention was designed as a secondary tier intervention intended to supplement the core, classroom reading instruction. As such, implementation was contingent on the school having the necessary instructional delivery model in place. In traditional public school settings, secondary tier interventions are often administered to small groups of students. Due to the setting for this study, the intervention was administered one-on-on resulting in an *atypical* instructional delivery format for a secondary tier intervention.

The classroom consisted of multi-age, multi-grade students. Typical reading instruction included daily whole class read alouds, teacher led small group instruction by grade level, and center rotations. Small group grade level instruction involved direct instruction in phonics and sight word instruction. During the reading block, students not working with the teacher rotated through literacy centers (i.e., independent reading, sight

word practice using white boards or magnets, and reading activities on the computer). Students spent between 20 min to 30 min at each center. The intervention took place at a small rounded table within the classroom. Intervention sessions replaced one center for each participant. In addition to the setting, the reading block structure (e.g., small group, grade level instruction, center rotations) dictated the *atypical* secondary tier instructional delivery format (i.e., one-on-one) utilized in this study.

University and school district IRB approvals were sought, obtained, and followed with regard to recruitment of participants. The classroom teacher was asked to nominate up to five students who were demonstrating reading difficulties and challenging behaviors in the classroom. Consent and student assent were secured for each student referred for participation. All students referred for participation were screened for inclusion based on the following criteria:

1. A score in the at-risk range (0 – 7 WCPM, 1st Grade; 0 -51 WCPM, 2nd Grade) on the *Dynamic Indicators of Basic Early Literacy Skills* (DIBELS, Good & Kaminski, 2007) Oral Reading Fluency (ORF) winter benchmark assessment, and
2. A score in the "high risk" range (raw score of 9 - 21) on the *Student Risk Screening Scale* (SRSS; Drummond, 1994) to determine behavioral risk.

Additionally, a review of student records was conducted to obtain information related to educational programing (e.g., special education eligibility, retention history, attendance). In an effort to control for potential confounding effects, students were excluded if they (a) had been retained and/or (b) were receiving additional intervention or

instruction (i.e., intervention support by a special education teacher) in reading beyond the core, classroom reading instruction. Three students met criteria for inclusion. Table 3.1 presents a summary of participant characteristics.

Table 3.1

Participant Characteristics

	Participant		
Variable	Caesar	Zane	Amari
Age	7.10	7.2	7.4
Grade	2.4	1.4	1.4
Gender	Male	Male	Female
Race/Ethnicity	H/H	H/H	AA
ELL	-	-	-
SED Eligibility	ED	-	Speech
WJ-III (SS)			
WA	94	101	81
LWI	89	83	78
TOWRE			
SWI (SS)	83	79	79
PDE (SS)	91	88	81
CTOPP (SS)			
PA	94	97	91
PM	100	94	85
RN	94	91	73
SRSS (Raw)	11	13	14
DIBELS (Raw)	16	6	5

Note. Range is 0 – 21 for the SRSS. SRSS raw scores from 9 to 21 indicate "high risk." Range is 0 – 100+ for the DIBELS. DIBELS raw scores from 0 to 7 WCPM indicate risk for 1st grade students; raw scores of 0 to 51 WCPM indicate risk for 2nd grade students. WJ-III = Woodcock-Johnson III Test of Academic Achievement; SS = standard score; WA = Word Attack; LWI = Letter - Word Identification; TOWRE = Test of Word Reading Efficiency; SWI = Sight Word Identification; PDE = Phonemic Decoding Efficiency; CTOPP = Comprehensive Test of Phonological Processing; Phonological Awareness Composite; Phonological Memory Composite; Rapid Naming Composite; SRSS = Student Risk Screening Scale; DIBELS = Dynamic Indicators of Basic Early Literacy Skills Oral Reading Fluency Benchmark Screening; AA = African American; H = Hispanic; ED = emotional disturbance.

PROCEDURES

In order to extend the previous study by Oakes et al. (2010), phases were replicated as closely as possible, given the availability of resources and reading programs. Phase descriptions that follow are modified versions of the conditions described by Oakes et al. (2010). Table 3.2 provides an overview of terms and acronyms for ease of interpretation and reference.

Phase A: Baseline

Baseline consisted of a supplemental reading curriculum, targeting early reading skills (e.g., phonemic awareness, phonics and fluency) implemented by the researcher. The *Fundations: Wilson Language Basics for K-3* (Wilson, 2000) program was used for this component and included multiple activities to build reading accuracy skills. This condition was comprised of approximately 20 minutes of phonemic awareness, phonics, and sight word practice followed by a ten minute read aloud. The *Fundations* segment consisted of four primary activities[1]: (1) *Drill Sounds,* a rapid review of sounds previously instructed, which included letters (t), digraphs (sh), glued sounds (unk), and closed syllable exceptions (ost); (2) *EchoFind Letters and Words,* a review practiced with letters, sounds, and words using magnetic tiles; (3) *Trick Words*, a review of grade level sight words; and, (4) *Dictation,* in which the researcher dictated a word or sentence, the student repeats the word(s), taps the word with his or her fingers (as needed), and then writes each word.

[1] The *Fundations* program consists of additional lesson components beyond the four primary components implemented in this study. Each unit and lesson was followed as described in the program manuals for each lesson with the exception of the following components:

Behavioral expectations were taught to the students through researcher modeling, and included: (a) come to the center ready to learn and participate, (b) keep hands and feet to self, (c) sit in learner position (i.e., seated in the chair with eyes on the researcher or the materials), and (d) use kind and appropriate words/language. In addition, desirable behaviors were taught including (a) come to the center and have materials (e.g., pencil, crayon) ready; (b) respond during instruction as appropriate; (c) follow along with the lesson activities; and (d) participate in each activity.

Phase Change

During baseline, student fluency performance was measured using weekly DIBELS ORF and WIF probes administered by the researcher. Phase changes occurred once stability was observed in the data or a "contra-therapeutic" trend, following at least three data points, was evident. A contra-therapeutic trend was defined as a weekly rate increase of less than the realistic growth rate of words read correct per minute. For first grade participants, a contra-therapeutic trend was defined as an increase of less than 2 words correct. For second grade participants, a contra-therapeutic trend was defined as a growth of less than 1.5 words correct. In addition, data on student off-task behavior (OTB) was recorded using momentary time sampling in 10 second intervals, with a nine second wait-one second record component (Kennedy, 2005).

Phase B: Fluency-Building

Similarly to baseline, Phase B consisted of a supplemental reading curriculum, targeting early reading skills (e.g., phonemic awareness, phonics and fluency), implemented by the researcher. This condition was comprised of approximately 20

minutes of phonemic awareness, phonics, and sight word practice, as in the baseline condition. The 10-min read aloud from the baseline condition was replaced with 10-min of fluency-building practice using *Voyager's Blastoff to Reading* (Voyager Expanded Learning, 2004) leveled fluency passages.

The fluency-building component consisted of 10-min of oral reading practice using grade level passages. The fluency-building component included corrective feedback from the researcher and student self-charting of progress. The *Voyager's Blastoff to Reading* (Voyager Expanded Learning, 2004) fluency passages were used for fluency building because of the number of probes available at the grade levels needed (i.e., first grade and second grade), ease of use, and accessibility of student and teacher materials. The student performed a minimum of three repeated readings of the grade level fluency passage and charted progress following each reading. The student read passages starting with the first passage in the sequence for the training week, moving through the passages as quickly as possible. Immediately following each reading, the student self-charted his/her progress by coloring in the boxes on his/her reading graph that corresponded with the number of words read correctly (see Appendix B). The researcher monitored progress to ensure that the student was reading the appropriate passage.

The behavioral expectations taught to the students during baseline were reviewed. ORF and OTB data was recorded in the same manner as in the baseline condition. Prior to phase change, a preference assessment was conducted with each participant to determine a motivating behavioral reinforcer for each participant. Student preferences were discussed with the classroom teacher to ensure students would have access to the

desired reinforcer. A menu of reinforcers was then created for each student with his/her preferred reinforcers. Phase changes occurred once stability was observed in the ORF and/or WIF data or a contra-therapeutic trend, following at least three data points, was evident.

Phase C: Teacher-Student Game Component

Similar to the Teacher-Student Game (see Lane & Beebe-Frankenberger, 2004), a reward system was implemented by the researcher, as an individualized participant plan. During the modified Teacher-Student Game (TSG-mod) each participant competed with the researcher for tallies. The student recorded his/her own tallies as indicated by the researcher when he/she demonstrated expected behaviors. Tallies were awarded with behavior specific praise. The researcher earned tallies each time the student engaged in unexpected behaviors. Unexpected behaviors included, but were not limited to: (a) coming into the session unprepared, (b) responding at inappropriate times or not participating/responding when participation/response was expected, (c) using inappropriate language (e.g., profanity), and (d) not participating in the lesson. If the student earned more tallies than the researcher, the student received a small sticker to put on his/her behavior chart (a monthly table with a 3 by 4 grid of small squares). If the researcher earned more points, then the student did not receive a sticker that day. When the student earned three stickers, which represented one week of instruction, he/she received the reward previously decided upon (based on the preference assessment). The behavioral expectations were reviewed as in previous phases. ORF and OTB data were monitored in the same manner as during baseline and Phase B.

DEPENDENT MEASURE

Reading

Oral reading fluency was measured by words read correctly per minute (WCPM). Two measures, DIBELS ORF (Good & Kaminiski, 2007) and Curriculum Based Measure in Reading Word Identification Fluency (WIF; Fuchs, Compton, & Fuchs, 2013), were used to measure fluency. Both measures were used to monitor student performance and phase changes. Both the DIBELS ORF and the WIF are progress-monitoring tools designed for individual administration. The DIBELS ORF passages consist of unfamiliar grade-level texts. Students have 1 minute to read the passage. The score is the number of correct words read in 1 minute. Tables 3.3 and 3.4 provide the Spache readability levels for the probes administered to first and second grade participants throughout the duration of the study. The WIF probes consist of a randomly ordered set of 100 Dolch words. Students have 1 minute to read the words. The score is the number of correct words read in 1 minute. The researcher administered the ORF and WIF probes to each participant weekly.

Behavior

Each participant's off-task behavior (OTB) was monitored. For the purposes of this dissertation study, OTB was defined as not having eyes orientated toward the assigned material or task. Some examples of OTB included: (a) talking to a peer or the researcher about something other than the assigned task (talking about the task is considered on-task behavior for the purposes of this study); (b) looking around the

classroom (e.g., looking at other students or adults); and (c) being out of seat for non-task related purposes (e.g., using the restroom, getting a drink; based on Shapiro, 2004).

Data on OTB was gathered by the researcher using momentary time sampling in 10 second intervals, with a nine second wait-one second record component, (Kennedy, 2005). Beck and colleagues (2009) have cited the research base for the efficacy of using momentary time sampling to observe the behavior of students with EBD. The researcher recorded data on OTB. A second trained observer monitored 33% of the session. Data on OTB was collected on the second intervention day each week, for the duration of the study.

Interobserver Agreement

Interobserver agreement (IOA) was calculated for behavior measures using occurrence/nonoccurrence agreement in which intervals were scored as agreement or disagreement. Agreements were calculated by totaling interval agreements and dividing by agreements plus disagreements, and multiplying by 100 to arrive at a percentage of agreements. Disagreements were calculated by totaling the disagreements, dividing the disagreements by agreements plus disagreements and multiplying by 100. Occurrence/nonoccurrence agreement was selected for two reasons. First, if IOA fell below the acceptable level (less than 80%) the observer was called in for retraining, similar to initial training sessions, to reduce the possible effects of "observer drift" (Kennedy, 2005, p.109). Also, occurrence/nonoccurrence agreement was chosen for its rigor and to demonstrate the extent to which consistency was obtained by different

observers (Kennedy, 2005). Both total agreement and point-by-point agreement are reported.

FIDELITY OF IMPLEMENTATION

Intervention implementation fidelity was measured during all phases using a researcher designed intervention implementation checklist (IIC). Two independent observers observed intervention sessions and completed an IIC for a total of 33% of sessions across all participants and phases. Interrater reliability (IOA) was calculated for 30% of the fidelity sessions using the same procedures noted above.

SOCIAL VALIDITY

Social validity pre- and post-intervention assessments were administered to the general education teacher in an effort to assess the social significance of the intervention (Lane & Beebe-Frankenberger, 2004). Social significance, or practical importance, is important to determine if the intervention produced meaningful changes (Lane & Beebe-Frankenberger, 2004). In addition, the assessment of social validity post-intervention increases the probability of designing interventions that are likely to be used by teachers to target specific skills (Lane & Beebe-Frankenberger, 2004). To assess social validity post-intervention, different self-report rating scales were administered to general education teachers and student participants. Self-reporting rating scales can be constructed and include non-empirically validated measures across stakeholders such as teachers, parents and students to provide a variety of perspectives regarding (a) the social significance of the intervention, (b) the social significance of the problem, and (c) treatment outcomes (Lane & Beebe-Frankenberger, 2004). An age appropriate measure

of social validity was administered to the participants. Modified versions of the *Teacher Pre-* and *Post-Intervention Acceptability and Importance of Effect Survey* (Lane & Beebe-Frankenberger, 2004) and the *Student Pre-* and *Post-Intervention Acceptability and Importance of Effects Survey (Gr. K-3)* (Lane & Beebe-Frankenberger, 2004) were administered to the classroom teacher and student participants, respectively.

DATA ANALYSIS

ORF, WIF, and OTB data were analyzed using traditional visual analysis procedures for single subject research by examining variability, level, and trend (Horner et al., 2005). Variability, or the extent to which individual data points stray from the overall trend was reported as a standard deviation (Kennedy, 2005). Level, or the average of the data within a phase, was reported as the mean for each phase (Kennedy, 2005). Trend, or line of best-fit that can be placed over the data within a phase, was evaluated through slope analysis (Kennedy, 2005). Quantitative estimations of trend were calculated using the least-squares regression, by fitting a straight line to the slope of the data by minimizing the variance of the observed data from the line (Kennedy, 2005). Growth rates were compared to expected normative patterns for first grade and second grade students (Fuchs et al., 1993) and the DIBELS ORF Benchmarks for first grade and second grade. A realistic growth rate (i.e., 1.5 WCPM for second graders and 2 WCPM for first graders) and an ambitious growth rate (i.e., 2 WCPM for second graders and 3 WCPM for first graders) were calculated for each student for comparison. The rate for each phase was calculated by: multiplying the expected normative (or ambitious) rate of growth by the number of weeks during the intervention phase and adding the mean

ORF/WIF from the previous phase (Lane, O'Shaughnessy, et al., 2001). Realistic and ambitious ORF and WIF growth rates were calculated for each intervention phase. OTB data were reported as mean percentage of OTB per week, with level, trend and variability of the data analyzed and reported.

Percent of non-overlapping data (*PND*) for reading measures were calculated by examining the number of treatment data points that were greater than the highest data point in baseline, dividing this value by the total number of treatment points, and multiplying this number by 100. *PND* for behavior measures were calculated by examining the number of treatment data points that were below than the lowest data point in baseline, dividing this value by the total number of treatment points, and multiplying this number by 100. The interpretation of *PND* scores was as follows: (a) *PND* less than 50% is considered ineffective, (b) *PND* between 50% and 70% is considered questionable, (d) *PND* between 70% to 90% are effective, and (e) *PND* greater than 90% is considered very effective (Scruggs & Mastropieri, 1998).

Table 3.2

List of Terms and Acronyms

Variable	Term	Acronym
Research Phases		
Phase A	Baseline	-
Phase B	Fluency-Building	-
Phase C	Teacher Student Game modified	TSG-mod
Measures/Variables		
Behavior		
	Off-Task Behavior	OTB
Reading		
	Dynamic Indicators of Basic Early Literacy[a]	DIBELS
	Oral Reading Fluency[a]	ORF
	Word Identification Fluency[b]	WIF
Data Analysis		
Effect-size Index		
	Percent of Non-overlapping Data	*PND*
Fidelity		
	Interobserver Agreement	IOA
	Intervention Implementation Checklist	IIC
Reading		
	Words Read Correct Per Minute	WCPM
	Words Read Correct Per Week	WCPW

Note. [a] = Good & Kaminski, 2007; [b] = Fuchs, Compton, & Fuchs, 2013.

Table 3.3

Spache Readability Estimates of 1st Grade DIBLES Passages

Probe	Title	Spache
1	The Ant Hill	2.2
2	The Rainy Day Picnic	2.2
3	Visiting Aunt Rose	2.3
4	My Big Sister	2.1
5	My Rock Collection	2.3
6	The Snow Person	2.1
7	The Cell Phone	2.3
8	The New Baby	2.2
9	A Birthday Party for Twins	2.1
10	The Train Trip	2.3
11	The Ice Cream Truck	2.2
12	The Beach	2.3
13	The Farmer's Market	2.3
14	The Robin's Nest	2
15	Camping at Home	2.1
16	My Lemonade Stand	2.2
	Mean all passages	2.2
	Standard Deviation all passages	0.1

Note. From Good, R. H. & Kaminski, R. A. (2002). DIBELS oral reading fluency passages for first through third grade (Technical Report No. 10). Eugene, OR: University of Oregon.

Table 3.4

Spache Readability Estimates of 2nd Grade DIBLES Passages

Probe	Title	Spache
1	Riding the bus to school	2.5
2	Twins	2.7
3	Open House at my school	2.4
4	Colors of the Rainbow	2.7
5	The wind has a job to do	2.7
6	Writing my life story	2.5
7	I'm a good babysitter	2.7
8	Playing shuffle with Gran	2.6
9	I Want to Fly in Space	2.5
10	The new bookstore	2.6
11	When Grandpa and I Garden	2.5
12	Going to the swimming pool	2.6
13	I'm adopted	2.4
14	Going to a Play	2.5
15	Going to the Movies at Home	2.6
16	I Want to be a Police Officer	2.6
	Mean all passages	2.6
	Standard Deviation all passages	0.1

Note. From Good, R. H. & Kaminski, R. A. (2002). DIBELS oral reading fluency passages for first through third grade (Technical Report No. 10). Eugene, OR: University of Oregon.

Chapter 4: Results

This dissertation study sought to explore the effects of a multicomponent, reading and behavioral, intervention on the reading fluency and off-task behavior performance of early elementary grade students who exhibit challenging behaviors. This chapter presents findings related to the five research questions that guided the study:

1. What is the effect of a targeted reading intervention on the reading skills of early elementary students identified with or at-risk for EBD?
2. What is the effect of a targeted reading intervention on the off-task behavior of students early elementary students with or at-risk for EBD?
3. What is the effect of adding a behavioral intervention to the reading intervention on the reading performance of students with or at-risk for EBD?
4. What is the effect of adding a behavioral intervention to the reading intervention on the off-task behavior of students with or at-risk for EBD?
5. Does the addition of a behavior support component to the academic intervention (a) increase student reading performance and (b) decrease student off-task behavior at a greater rate than implementing the academic intervention alone?

Fidelity of implementation results are reported for the independent variable across phases. Fidelity data are presented first in order to provide context for interpretation of the results of the intervention on student ORF, WIF, and OTB performance. Next, individual student performance results are detailed with regard to ORF, WIF, and OTB across phases. Realistic and ambitious reading goal were calculated for each participant for the fluency-building and TSG-mod phases. Reading goals and findings are also presented. Social validity findings are also reported.

FIDELITY OF IMPLEMENTATION

The intervention was designed to be implemented 3 days per week, for 30-min per day over a period of 16 weeks. Zane participated in a total of 47 sessions with sessions lasting an average of 28.22 min (*SD* = 3.25) each. Amari participated in 48 sessions lasting an average of 28.95 min (*SD* = 1.85) each. Caesar participated in 46 sessions lasting an average of 28.11 min (*SD* = 4.15) each.

Fidelity of implementation results are reported for each phase across participants (see Table 4.1). An independent observer observed 33% of sessions for each participant across each phase. A second trained observer observed 30% of those sessions for the purposes of IOA. Data reported are (1) mean intervention fidelity across all components per phase; (2) IOA data; and, (3) percentage of sessions observed for IOA.

Table 4.1

Fidelity of Implementation Across Participants and Phases

Participant	Phase	Observer % (*SD*)	IOA % (*SD*)
Zane	Baseline	100.0 (0.0)	100.0 (0.0)
	Fluency	96.7 (2.9)	95.0 (0.0)
	TSG-mod	99.6 (1.3)	98.7 (2.3)
Amari	Baseline	100.0 (0.0)	100.0 (0.0)
	Fluency	100.0 (0.0)	100.0 (0.0)
	TSG-mod	100.0 (0.0)	100.0 (0.0)
Caesar	Baseline	96.4 (5.8)	100.0 (0.0)
	Fluency	94.7 (5.5)	89.0 (0.0)
	TSG-mod	97.3 (2.3)	97.3 (2.3)

Note. TSG-mod = Teacher Student Game-modified.

Baseline

During the baseline phase, Zane participated in 12 sessions (4 weeks), Amari participated in 21 sessions (7 weeks), and Caesar participated in 29 sessions (10 weeks).

The independent observer observed 33% of all baseline sessions. Overall fidelity scores for baseline were 98.3 % (*SD* = 4.30) across all participants. IOA was calculated for 30% of fidelity sessions during baseline. IOA scores were consistent with independent observer data, resulting in IOA of 100% across baseline sessions.

Intervention: Fluency

During the fluency-building phase, Zane, Amari and Caesar participated in nine instructional sessions (3 weeks) each. As in baseline, the independent observer recorded fidelity of implementation for a total of 33% of all fluency-building sessions. Overall fidelity scores for the fluency-building phase were 97% (*SD* = 3.89) across all participants. IOA was calculated for 30% of fidelity sessions during the fluency-building phase. IOA scores were consistent with independent observer data for the sessions observed, resulting in IOA of 100% across fluency-building sessions.

Intervention: TSG-mod

During the baseline phase, Zane participated in 26 instructional sessions (9 weeks), Amari participated in 18 sessions (6 weeks), and Caesar participated in 8 sessions (3 weeks). As in previous phases, an independent observer observed 33% of all TSG-mod sessions. Overall fidelity scores during TSG-mod were 99% (*SD* = 1.57) across all participants. IOA was calculated for 30% of fidelity sessions. Across intervention session observed, IOA scores were consistent with independent observer data, resulting in IOA of 100%.

INDIVIDUAL PARTICIPANT PERFORMANCE

Zane

Oral Reading Fluency

Visual inspection of baseline data revealed variable participant performance (see Figure 4.1). Despite variable performance, Zane demonstrated a slope of 0 words correct per week (WCPW; see Table 4.2). Upon visual inspection of Zane's last three baseline data points, a contra therapeutic trend was evident. Zane's mean WCPM during baseline was 5.5 (*SD* = 3). During weeks 3 and 4, visual and further inspection of ORF performance revealed a contra therapeutic trend—that is, ORF growth was below the realistic growth rate of 2 WCPW). A phase change was initiated due to the contra therapeutic trend. Visual inspection of the data at phase change appeared to support experimental control and an experimental effect. Analysis of the fluency-building phase data revealed positive trends in ORF (see Figure 4.1). Data analysis revealed changes in trend from negative to positive and immediate performance increases (+3 WCPM) for Zane upon intervention implementation. Zane's ORF slope increase was three-fold (+4.5 WCPW) during fluency-building, with his mean WCPM increasing to 9.67 (*SD* = 4.51). Due to evidence of a contra therapeutic trend in WIF performance (see *Word Identification Fluency* section to follow), a phase change was initiated. Visual inspection of the data revealed variability in ORF performance during the TSG-mod phase (see Figure 4.1). Upon phase change, an immediate increase in WCPM (+2) was noted. Slope analysis revealed a positive trend (+1.68 WCPW). This trend was less than his slope increase (+4.5 WCPW) during the previous phase. Zane's mean WCPM more than doubled over the previous phase (*M* = 20.3, *SD* = 6.36). Zane concluded the study on an upward trend. Zane exceeded the ambitious ORF goals set for him during both fluency-

building and TSG-mod phases (see Table 4.3). ORF *PND* was 67% for the fluency-building phase and 89% for the TSG-mod phase.

Word Identification Fluency

Visual inspection of baseline WIF data revealed relatively stable data (see Figure 4.1) and a slope of 0 WCPW (see Table 4.3). Zane's mean WCPM during baseline was 4.5 (*SD* = 0.58). Visual inspection and analysis of trend, level, and variability following phase change suggested an experimental control and effect for Zane. During the fluency phase, a positive increase in level was noted. Slope increase was 2.5 WCPW. Visual inspection of TSG-mod data revealed variability of data. Despite the lack of an immediate effect upon phase change for Zane, further data analysis revealed an immediate increase in WCPM (+2) over the previous week. Slope analysis supported visual analysis and revealed an increase in level. Zane's WIF slope increase (+2.58 WCPW) exceeded the WIF slope during the fluency-building phase. His mean WCPM more than doubled over the previous phase (*M* = 24.2, *SD* = 7.32). Zane exceeded the realistic WIF goal set for him during fluency-building and the ambitious goal during the TSG-mod phases (see Table 4.3). WIF *PND* was 100% during both the fluency-building and TSG-mod phases.

Off-Task Behavior

Visual inspection of baseline OTB revealed variable data (see Figure 4.2). Further data analysis revealed a slope of 0 (see Table 4.5). Zane's mean OTB during baseline was 22.03% (*SD* = 12.58). This means that during the baseline session, Zane was off-task, on average, 22% of the time. The greatest percentage of time he spent off-task during baseline was 39% and the least was nearly 12% of the time. Phase changes were contingent upon reading performance. At phase change, Zane was on an upward trend for

OTB (i.e., off-task behavior was increasing). Analysis of trend, level, and variability through visual inspection of OTB data during fluency building suggested an experimental control and effect for Zane. During the fluency phase, Zane demonstrated a decreasing trend as OTB decreased from baseline (M = 16.06, SD = 8.48). His greatest percentage of time off-task during this phase was 22.6% and his least percentage of time off-task was 7%. Upon phase change from fluency-building to TSG-mod, an immediate effect was not evident. Further data analysis appeared to support an experimental effect. His OTB slope during TSG-mod indicated a negative trend (- 0.78%). Zane's mean OTB during TSG-mod was nearly five times less (M = 3.79%, SD = 3.53) than during the fluency-building phase. This means that, on average, Zane was off task for 3.5% of the time during sessions in the fluency-building phase. His greatest percentage of time off-task during this phase was 11%. During this phase, one data point indicates that Zane was on-task for 100% of the time. OTB *PND* was 33% for the fluency-building phase and 89% for TSG-mod.

Amari

Oral Reading Fluency

Throughout baseline, Amari's performance was relatively stable (slope of -0.04 WCPW). Amari's mean WCPM during baseline was 7.14 (SD = 3.24). During weeks 6 and 7, Amari's ORF performance decreased and a contra therapeutic trend was evident (i.e., ORF performance from week 6 to week 7 was below the realistic growth rate of 2 WCPW): a phase change was initiated. Visual inspection of the data at phase change appeared to support experimental control and an experimental effect. Analysis of the fluency-building phase data revealed positive trends in ORF (see Figure 4.1). Data analysis revealed changes in trend and immediate performance increases (+3 WCPM) for

Amari upon intervention implementation. During fluency-building, Amari's mean WCPM more than doubled (M = 14.67, SD = 1.53) when compared to baseline performance (M = 7.14, SD = 3.24). Upon phase change, visual analysis suggested that Amari's ORF performance remained the same as the previous week. Analysis of slope revealed a positive trend (+2.43 WCPW). ORF slope results during the TSG-mod phase exceeded the ORF slope (+2 WCPW) from the previous phase. Amari's mean WCPM increased to 24.8 (SD = 5.64) during TSG-mod. Amari completed the study on an upward trend. Amari did not reach the realistic ORF goal set for fluency-building and exceeded the ambitious goal set for the TSG-mod phase. ORF *PND* was 100% for the fluency-building phase and 83% for the TSG-mod phase.

Word Identification Fluency

Visual inspection of Amari's baseline WIF performance revealed relatively stable data (see Figure 4.1). Further data analysis revealed a slope of 0 WCPW (see Table 4.3). Amari's mean WCPM during baseline was 11.14 (SD = 1.77). Despite visual analysis supporting an upward trend in WIF, Amari's ORF performance indicated a contra therapeutic trend; therefore, a phase change was initiated at week 8. Analysis of trend, level, and variability through visual inspection suggested an experimental control and effect for Amari during fluency-building. Likewise, a positive slope (4 WCPW) was noted. Amari's mean WCPM increased to 17 (SD = 4.36). Although WIF performance was increasing throughout fluency-building, these increases fell short of the expected weekly growth rate of +2 WCPW. Therefore, a contra therapeutic trend was noted and a phase change initiated following week 10. Visual inspection of TSG-mod data revealed an immediate intervention effect and variable performance throughout the phase. Upon phase change, Amari's WIF performance increased by 6 WCPM. Slope analysis

supported visual analysis and revealed an increase in level (2.09 WCPW). Her mean WCPM increased to 28.18 (*SD* = 4.62). Amari exceeded the ambitious WIF goals set for her during both fluency-building and TSG-mod phases. WIF *PND* from was 67% for the fluency-building phase and 100% for TSG-mod.

Off-Task Behavior

Visual inspection of baseline OTB data revealed some variability (see Figure 4.2). Despite the appearance of variability, Amari's OTB baseline slope was 0 (see Table 4.5). Her mean OTB during baseline was 10.45% (*SD* = 5.11). Amari's greatest percentage of time off-task during a baseline session was 20.5% and least amount was 7%. As noted previously, phase changes were contingent upon reading performance. Therefore, although Amari demonstrated a decreasing trend in OTB, a phase change was initiated following week 8. Analysis of trend, level, and variability through visual inspection of data during fluency-building suggested an experimental control and effect for Amari, with a decreasing trend noted. Amari's OTB decreased at a rate of -2.47% across the fluency-building condition, and her mean OTB decreased to 6.13 (*SD* = 2.52). Her greatest percentage of time off-task during this phase was nearly 9% and her least percentage of time off-task was 4%. A decreasing trend was noted throughout fluency-building and prior to phase change (fluency-building to TSG-mod). Immediately upon phase change, her OTB performance increased slightly. Despite the initial increase, further data analysis indicated a decreasing trend and slope (-0.55%). Amari's mean OTB during TSG-mod was 3.7% (*SD* = 3.28). Her highest data point during this phase indicated that Amari was off-task for 8% of the time, with her lowest data point indicating off-task behavior during less than 1% of the session time. OTB *PND* was 67% during both fluency-building and TSG-mod phases.

Caesar

Oral Reading Fluency

Caesar demonstrated variable performance throughout baseline. Around week 7, Caesar began to display oppositional behavior when directed to the intervention center. He began to express dissatisfaction with the sessions, indicating that he was "bored." The displays of opposition to participation coupled with a slope of 0 words correct per week, resulted in the decision to move Caesar into the fluency-building phase despite his upward trend in week 10. Caesar's mean WCPM during baseline was 17.9 (*SD* = 7.17). Upon phase change (baseline to fluency-building), visual inspection revealed a substantial change in level (+11 WCPM) and indicated a positive intervention effect. Despite the appearance of a positive trend upon visual inspection, further data analysis revealed the slope of Caesar's performance decreased to 1 WCPW during fluency-building. However, his mean WCPM more than doubled (*M* = 40.3, *SD* = 1.15). A phase change was initiated due to the contra therapeutic trend of ORF and WIF data (see *Word Identification Fluency* section to follow). Upon phase change, an immediate increase in WCPM (+2) was noted. Caesar's slope increased four-fold over the previous phase (+4 WCPW). Caesar exceeded the ambitious ORF goals set for him during both fluency-building and TSG-mod phases (see Table 4.3). His mean WCPM increased to 47 (*SD* = 4). ORF *PND* was 100% for both the fluency-building and TSG-mod phases.

Word Identification Fluency

Visual inspection of baseline WIF data revealed variable performance (see Figure 4.1). Further data analysis revealed a slope of 0 WCPW (see Table 4.3). As noted previously, Caesar began to display oppositional behavior when coming to center and expressed dissatisfaction with the sessions, indicating that he was "bored." The displays

of opposition to participation coupled with a slope of 0 words correct per week, resulted in the decision to move Caesar into the fluency-building phase despite his increasing trend in week 10. Caesar's mean WCPM during baseline was 25.6 (*SD* = 5.48). Visual inspection of the data upon phase change appeared to establish an immediate experimental effect. Although Caesar's data were demonstrating an upward trend at phase change (baseline to fluency-building), visual inspection revealed a substantial immediate effect (+10 WCPM) upon intervention implementation. Phase change was made despite the upward trend due to the nature of the research questions (i.e., additive effects over other conditions). WIF slope during fluency-building was 3.5 WCPW. Caesar's mean WCPM nearly doubled (*M* = 45.3, *SD* = 6.03) during this phase. As noted previously, a contra therapeutic trend was evident during week 13 and a phase change was initiated. Visual inspection of TSG-mod data revealed an immediate intervention effect and positive trend. Slope analysis supported visual analysis and revealed an increase in level (6.5 WCPW). His mean WCPM increased to 56.7 (*SD* = 6.66). Caesar exceeded the ambitious WIF goals set for him during both fluency-building and TSG-mod phases (see Table 4.3). WIF *PND* was 100% for the fluency-building phase and 67% for TSG-mod.

Off-Task Behavior

Visual inspection of baseline OTB data revealed variable data (see Figure 4.2). Caesar was on an upward trend (i.e., off-task behavior was increasing) at phase change. Despite the appearance of variability of data, further data analysis revealed a slope of 0 (see Table 4.5). As noted previously, Caesar began to display oppositional behavior when coming to center and expressed dissatisfaction with the sessions, indicating that he was "bored." This behavior carried over into intervention sessions and was evident upon

visual inspection of the data. Caesar's mean OTB during baseline was 26.7% (*SD* = 9.83), and ranged from 44.7% to 12%. Upon visual inspection of OTB data at phase change (baseline to fluency-building), an immediate experimental effect was noted. Despite an initial drop in level and what appeared to be a negative trend, Caesar ended the phase trending upward and with a positive slope (+8.65%). His mean OTB decreased to 23.92% (*SD* = 10.8) during fluency-building, and ranged from 36% - 16.5%. Upon phase change (fluency-building to TSG-mod), visual inspection of the OTB data revealed an immediate intervention effect for Caesar, with data varying throughout the phase. His OTB data revealed a decreasing slope (-0.61%), despite ending the intervention on what appears to be an upward trend. In addition, Caesar's mean OTB during TSG-mod decreased to 8.11% (*SD* = 2.29). During the TSG-mod phase, Caesar's highest data point for off-task behavior was 10%, with his lowest data point at 5.6%. OTB *PND* was 0% during fluency-building and 100% during TSG-mod.

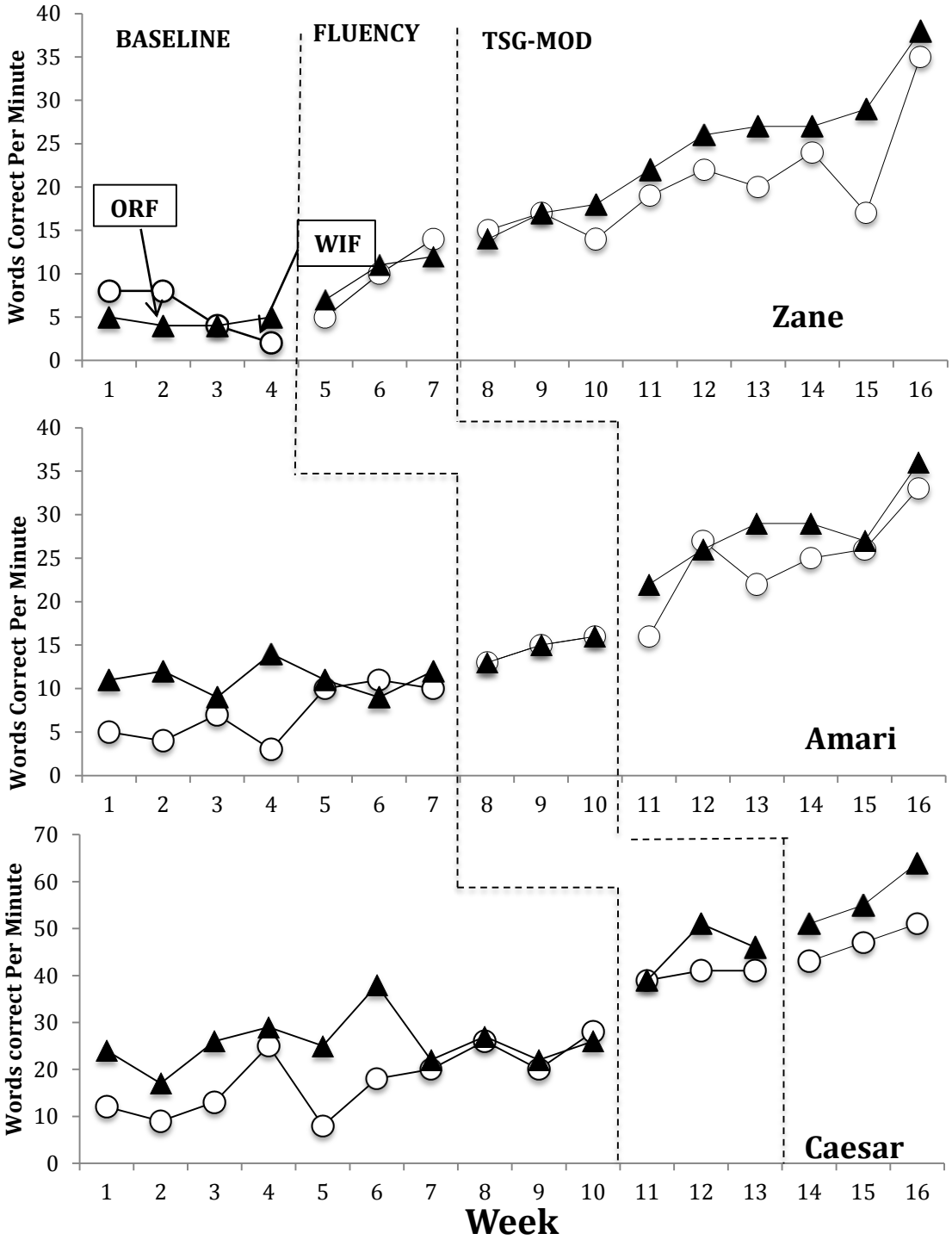

Figure 4.1 Participant Words Correct Per Minute

Table 4.2

Student ORF Growth by Phase

		ORF	
	Phase (weeks)	*M* (SD)	Slope (Sy.x)
Zane	Baseline (4)	5.5 (3)	-2.2 (0.90)
	Fluency (3)	9.67 (4.51)	4.5 (0.99)
	TSG-mod (9)	20.3 (6.36)	1.68 (0.53)
	PND-a	67%	
	PND-b	89%	
Amari	Baseline (7)	7.14 (3.24)	1.14 (0.58)
	Fluency (3)	14.67 (1.53)	1.5 (0.96)
	TSG-mod (6)	24.8 (5.64)	2.43 0.65)
	PND-a	100%	
	PND-b	83%	
Caesar	Baseline (10)	17.9 (7.17)	1.7 (0.52)
	Fluency (3)	40.3 (1.15)	1 (0.75)
	TSG-mod (3)	47 (4)	4 (1.00)
	PND-a	100%	
	PND-b	100%	

Note. ORF = Oral Reading Fluency; TSG-mod =Teacher Student Game modified; *PND* = percentage of non-overlapping data points; a = comparing Baseline to Fluency; b = comparing Fluency to TSG-mod.

Table 4.3

WCPM Reading Goals by Phase

	Fluency			TSG-mod		
	Realistic	Ambitious	Actual	Realistic	Ambitious	Actual
Zane						
ORF	10.7	13.7	14	15.7	18.7	35
WIF	10.7	13.7	12	16	19	38
Amari						
ORF	16.3	19.3	16	20.7	23.7	35
WIF	16.3	19.3	22	23	26	38
Caesar						
ORF	29.2	30.7	41	31.2	34.5	51
WIF	29.5	31	51	32.7	36	64

Note. Realistic and ambitious growth rates calculated based on Fuchs, Fuchs, Hamlett, Walz, & Germann (1993).

Table 4.4

Student WIF Growth by Phase

		WIF	
	Phase (weeks)	*M* (SD)	Slope (Sy.x)
Zane	Baseline (4)	4.5 (0.58)	0 (0.00)
	Fluency (3)	10 (2.65)	2.5 (0.89)
	TSG-mod (9)	24.2 (7.32)	2.58 (0.92)
	PND-a	100%	
	PND-b	100%	
Amari	Baseline (7)	11.14 (1.77)	-0.04 (0.00)
	Fluency (3)	17 (4.36)	4 (0.84)
	TSG-mod (6)	28.18 (4.62)	2.09 (0.71)
	PND-a	67%	
	PND-b	100%	
Caesar	Baseline (10)	25.6 (5.48)	0.3 (0.03)
	Fluency (3)	45.3 (6.03)	3.5 (0.34)
	TSG-mod (3)	56.7 (6.66)	6.5 (0.95)
	PND-a	100%	
	PND-b	67%	

Note. WIF = Word Identification Fluency; TSG-mod =Teacher Student Game modified; *PND* = percentage of non-overlapping data points; a = comparing Baseline to Fluency; b = comparing Fluency to TSG-mod.

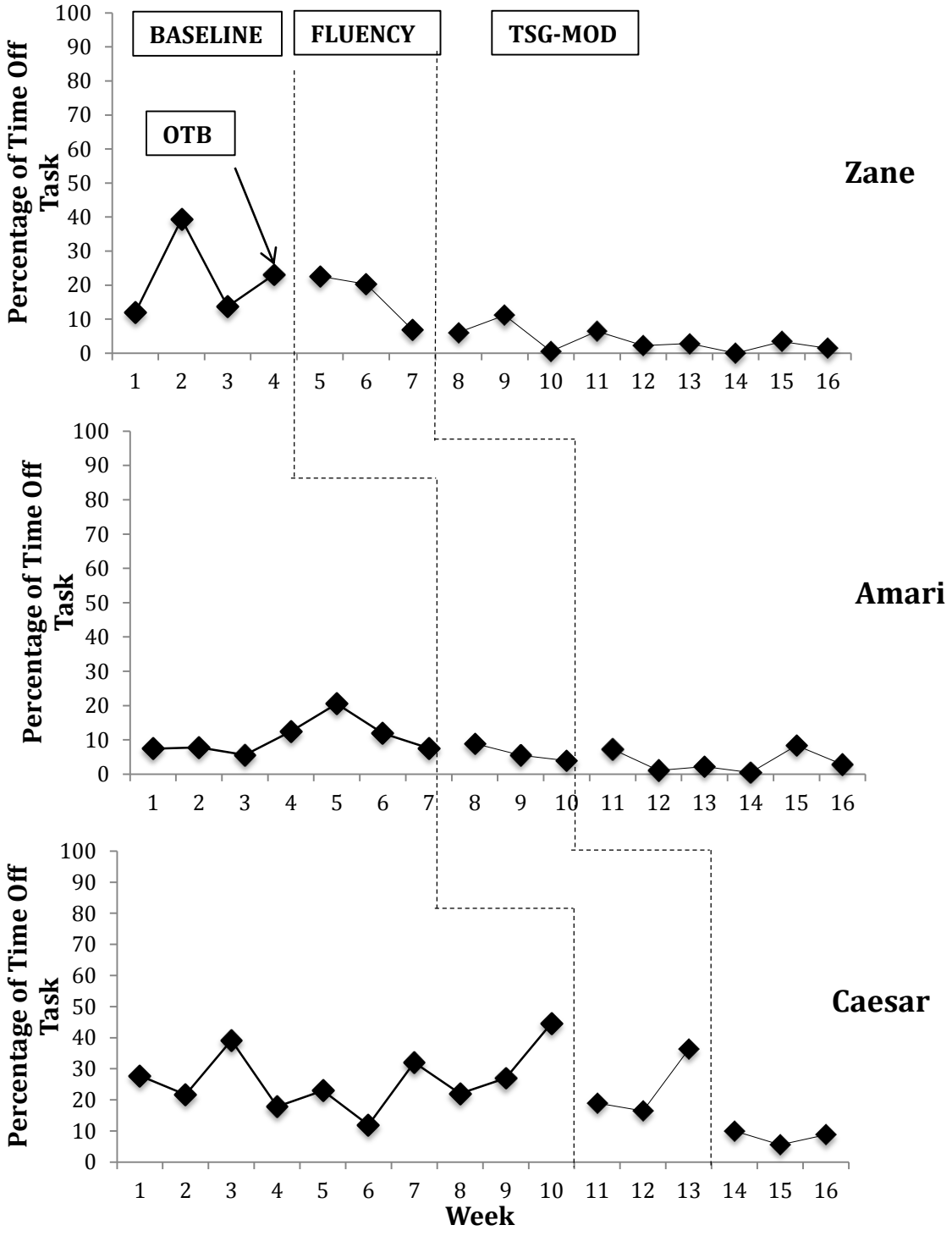

Figure 4.2 Participant Percentage of Time Off-task

Table 4.5

Student OTB Growth by Phase

		OTB	
	Phase (weeks)	*M* (SD)	Slope (Sy.x)
Zane	Baseline (4)	22.03 (12.58)	0.79 (0.01)
	Fluency (3)	16.06 (8.48)	-7.85 (0.86)
	TSG-mod (9)	3.79 (3.53)	-0.78 (0.36)
	PND-a	33%	
	PND-b	89%	
Amari	Baseline (7)	10.45 (5.11)	0.84 (0.13)
	Fluency (3)	6.13 (2.52)	-2.47 (0.96)
	TSG-mod (6)	3.7 (3.28)	-0.55 (0.00)
	PND-a	67%	
	PND-b	67%	
Caesar	Baseline (10)	26.7 (9.83)	0.82 (0.06)
	Fluency (3)	23.92 (10.8)	8.65 (0.61)
	TSG-mod (3)	8.11 (2.29)	-0.61 (0.07)
	PND-a	0%	
	PND-b	100%	

Note. OTB = Off Task Behavior; TSG-mod =Teacher Student Game modified; PND = percentage of non-overlapping data points; a = comparing Baseline to Fluency; b = comparing Fluency to TSG-mod.

SOCIAL VALIDITY

Teacher Survey

The classroom teacher completed the Teacher Pre-Intervention Acceptability Rating Survey prior to the first week of the baseline condition. The classroom teacher scored each item with the highest points (5) indicating high levels of acceptability of the intervention (60 total scale). A post-intervention survey was administered during the final week of intervention (week 16). Acceptability ratings for the teacher remained high for post-intervention (59). The classroom teacher rated one item (*The intervention was acceptable to students*) lower post-intervention (4 out of 5). As noted previously, Caesar began to display oppositional behaviors prior to intervention sessions. Once he began the fluency-building phase, his oppositional behaviors subsided. All other item ratings were consistent with pre-intervention ratings.

Student Survey

Student Pre-Intervention Acceptability Rating Surveys were administered prior to the first week of the baseline condition. All students scored each item with the highest points (4) indicating high levels of acceptability of the intervention (24 total scale). The researcher administered post-intervention surveys during the final week of intervention (week 16). Acceptability ratings for students remained high for post-intervention (M = 23.3, *SD* = 1.15). Amari and Zane rated the intervention the highest (24); both were consistent with pre-intervention ratings. Caesar rated two items with 3 points (*I like what I earned to do my best*; *The new skills I learned helped me*). Overall, Caesar rated the intervention highly (91.67%).

SUMMARY

This study focused on the effect of a multicomponent, reading and behavior intervention, on the reading (ORF and WIF) and behavioral (OTB) performance of three early elementary students with reading and behavioral challenges. The first research question addressed the effect of the fluency-building condition on participants' reading performance. Visual inspection of ORF and WIF data appeared to indicate variability in participant performance across phases. Further analysis of the data provided evidence to support an experimental effect on the ORF and WIF performance of all three participants. Overall ORF and WIF scores increased for all participants above baseline performance during the fluency-building condition. The second research question addressed the effect of the fluency-building component on student behavior. As with ORF and WIF performance, OTB performance was impacted by the implementation of the fluency-building condition, with two students (Amari and Zane) demonstrating decreases in off-task behavior. The third research question addressed the effect of the TSG-mod condition on ORF and WIF performance. Despite decreases in slope when compared to the fluency-building condition, implementation of the TSG-mod condition resulted in increased ORF and WIF scores across all participants. Although *PND* analysis resulted in variability of intervention effectiveness across participants, analysis of within and across participant data, coupled with analysis of within and across phase changes, supports not only experimental control but also positive intervention effects for some participants. In fact, slope analysis revealed that student ORF and WIF performance increased during the TSG-mod condition for all participants. For two students (Amari and Caesar), the implementation of the TSG-mod phase resulted in greater ORF gains (slope increases) over the fluency-building phase. The implementation of the TSG-mod phase also resulted in greater gains in WIF performance for Caesar and Zane. The fourth research question

addressed the impact of the TSG-mod condition on student behavior. Not surprisingly, all students demonstrated decreases in OTB during this condition. Once the TSG-mod condition was implemented, further decreases in student OTB were noted beyond those demonstrated in the fluency-building condition. The final research question was twofold: addressing the effect of the TSG-mod condition on the rate of both reading (ORF and WIF) increases and behavior (OTB) decreases. Overall, it can be concluded that the implementation of the TSG-modification increased student ORF and WIF performance while reducing off-task behavior. It was more effective for increasing the WIF performance of two participants (Caesar and Zane) over the fluency-building component alone. In addition, the TSG-mod condition was more effective for increasing the ORF performance for two students (Amari and Caesar). Despite *PND* results, TSG-mod appeared to be more effective than the fluency-building condition for Caesar on ORF, OTB, and WIF performance; Zane on WIF performance; and, for Amari on ORF performance. At the conclusion of the study, both Amari's and Zane's ORF scores were below the DIBELS end of year benchmark for their grade, but no longer in the risk range. Despite considerable increases in ORF across phases, Caesar's ORF scores were still in the risk range at the conclusion of the study. Although slope decreases in OTB were greater for two students (Amari and Zane) during the fluency-building condition, mean OTB decreased substantially for all participants during TSG-mod. In fact, OTB decreased by 40% for Amari, 66% for Caesar, and 76% for Zane during the TSG-mod condition over the previous condition. A discussion of these variables, their implications for practice, limitations of this study, and recommendations for future research are presented in Chapter 5.

Chapter 5: Discussion

The relationship between reading achievement and behavior has been well documented in the research (Lane et al., 2007; Lane et al., 2002; Nelson et al., 2003; Trout et al., 2003; Lane et al., 2001). Researchers agree that students with and at-risk for EBD spend more time (a) engaging in unrelated activities, (b) off-task, (c) in time-out, (d) waiting for instructions, and (e) completing independent worksheets and seatwork (Chard & Kame'enui, 2000; Morgan et al., 2008; Vaughn et al., 2002). In addition to limited academic engagement, research suggests that students with EBD demonstrate significant academic underachievement, particularly in the area of reading (Lane et al., 2008; Nelson et al., 2004; Reid et al., 2004; Walker et al., 2005). Among elementary students with EBD in particular, research has noted underachievement in the area of reading (Lane et al., 2008). Difficulties with academic and behavioral performance among this population highlight the notion that students with or at-risk for EBD who also struggle academically require research validated practices for improving both academic and behavioral performance (Algozzine, Wang, White, Cooke, & Marr, 2012).

Despite a moderate increase in the study of achievement and performance for students with EBD (Kostewitz & Kubina, 2008), researchers agree that current research on reading interventions for students with and at-risk for EBD remains limited (e.g., Coleman & Vaughn, 2000; Hinshaw, 1992; Levy & Chard, 2001; Nelson et al., 2011; Rivera et al., 2006; Vaughn et al., 2001). Many questions remain about effective scientifically-based academic (e.g., reading) and behavioral practices for students with or at-risk for EBD (Mooney et al., 2004). In particular, Rivera and colleagues (2006) noted

that although behavior supports often accompanied reading interventions, not all researchers reported behavioral outcomes. In addition, Rivera and colleagues (2006) could not identify any studies that compared reading only interventions with reading and behavior support interventions. Therefore, questions still remain regarding the effectiveness and necessity of behavior supports in conjunction with reading intervention. Likewise, the impact of behavior support components on reading skill acquisition remains unclear.

The purpose of this study was to contribute to the literature on reading interventions for students with and at-risk for EBD and to specifically address questions raised by previous researchers (i.e., Rivera et al., 2006). This study sought to evaluate the impact of a multicomponent intervention on the reading and behavior performance of students identified with reading and behavior risk. A multiple-baseline across participants (A-B-C) design study with three participants was used to investigate the impact of the behavior support component on student reading fluency acquisition while simultaneously gathering OTB data, to determine if (a) the addition of the behavior component resulted in an increase in the rate of fluency growth above and beyond that which may occur with a reading-only intervention, and (b) if decreases in behavior corresponded to increases in fluency. Reading fluency and OTB performance during a fluency-building condition were compared to a baseline condition consisting of a supplemental reading curriculum. Performance during the fluency-building condition was then compared with performance during the TSG-mod phase. Five research questions were explored:

1. What is the effect of a targeted reading intervention on the reading skills of early elementary students identified with or at-risk for EBD?
2. What is the effect of a targeted reading intervention on the off-task behavior of early elementary students identified with or at-risk for EBD?
3. What is the effect of adding a behavioral intervention to the reading intervention on the reading performance of students with or at-risk for EBD?
4. What is the effect of adding a behavioral intervention to the reading intervention on the off-task behavior of students with or at-risk for EBD?
5. Does the addition of a behavior support component to the academic intervention (a) increase student reading performance and (b) decrease student off-task behavior at a greater rate than implementing the academic intervention alone?

This chapter examines the findings of this study with regard to the above stated research questions. First, a discussion of findings related to intervention effects on participants' reading fluency (both ORF and WIF) growth is presented. The second part of this chapter addresses intervention effects on participants' off-task behavior. A discussion of findings pertaining to the additive effect of the behavioral support component on participant reading and behavioral performance follows. The chapter concludes with a discussion of study limitations, implications for practice, and recommendations for future research.

READING FLUENCY

This study examined the effect of a multicomponent,secondary tier intervention on the oral reading fluency and word-identification fluency performance of three early

elementary students. Two research questions focused on the effects of intervention phases on student ORF and WIF performance. Despite the appearance of variable ORF and WIF performance across participants and phases, all students made gains in ORF and WIF across phases (baseline to fluency-building and fluency-building to TSG-mod). Further analysis of the data provided evidence to support an experimental effect on the ORF and WIF performance of all three participants.

The first research question addressed the effect of the fluency-building condition on participants' reading performance. Research supports the efficacy of repeated readings (e.g., Mastropeiri, Leinart, & Scruggs, 1999) on the ORF performance of students with dual risk (Oakes et al., 2010). It was therefore hypothesized that participants ORF scores would increase upon implementation of the fluency-building condition. It was likewise hypothesized that repeated readings would also positively impact student WIF growth. Overall ORF and WIF scores increased for all participants above baseline performance during the fluency-building condition, supporting both hypotheses. During baseline, two students demonstrated variable ORF and WIF performance. Prior to phase change (baseline to fluency-building), two students demonstrated decreasing trends in ORF. Upon phase change, an immediate experimental effect on ORF was noted for all students, and on WIF for one participant. The fluency-building phase produced overall increased gains in ORF and WIF, over baseline performance. Prior to phase change from fluency-building to TSG-mod, two students demonstrated upward trends in ORF, although for one student this was a contra therapeutic trend. The third student did not demonstrate gains; rather, a contra-therapeutic trend was noted. These findings support previous research demonstrating positive effects on ORF (Oakes et al., 2010). Despite the aforementioned upward trends, phase changes were still implemented in order to assess the additive effect of the intervention on reading and behavioral performance.

The third research question addressed the effect of the TSG-mod condition on ORF and WIF performance. Despite decreases in slope when compared to the fluency-building condition, implementation of the TSG-mod condition resulted in increased ORF and WIF scores across all participants. Although *PND* analysis resulted in variability of intervention effectiveness across participants, analyses of within and across participant data, coupled with analyses of within and across phase changes, supports not only experimental control but also positive intervention effects. In fact, slope analysis revealed that student ORF and WIF performance increased during the TSG-mod condition for all participants. Upon implementation of the TSG-mod condition, an immediate experimental effect was noted for two participants for WIF. *PND* results indicated that the fluency-building component was very effective on the ORF and WIF performance of two participants and questionable for another. Implementation of the TSG-mod condition appeared to be effective on the ORF performance of two participants and very effective for one. *PND* results revealed that the TSG-mod condition was every effective on the WIF performance of two participants and questionable for one.

Since *PND* results reflected variable intervention effects, the social significance (Gresham, 2002; Lane & Beebe-Frankenberger, 2004) of ORF and WIF increases were explored. Individual participant reading goals were established for ORF and WIF for both the fluency-building and TSG-mod phases, based on realistic and ambitious growth rates (Fuchs et al., 1993). Although realistic and ambitious weekly growth rates have been established (Fuch et al., 1993), students are not expected to make those gains each consecutive week. Over time, it is expected that a student will demonstrate an average weekly rate of growth commensurate with the respective weekly growth rate for his/her grade level. During the fluency-building phase, one student exceeded the ambitious goals set for ORF and WIF; one student exceeded the realistic goal for ORF but fell short of the

ambitious goal; and, one student fell short of the realistic ORF goal. During the TSG-mod phase, all participants exceeded the ambitious goals set for them for both ORF and WIF. These findings also stand to support the conclusion that although *PND* results were variable across participants, practical significance indicates that the TSG-mod condition was effective in producing substantial gains for all participants above and beyond those demonstrated during the fluency-building condition. When comparing these results with previous research, they are somewhat more promising (Lane et al., 2001; Oakes et al., 2010).

There may be several explanations for the divergence from previous findings. First, study duration may have been a factor in student response. In this study, students participated for 16 weeks. Participants of Oakes and colleagues (2010) study spent 21 weeks in intervention, while students in the study by Lane et al. (2001) participated for 10 weeks. Authors noted that the duration of the study by Lane and colleagues may have been insufficient in to meet the needs of the participants. Also, unlike the Oakes study, all participants in this study demonstrated dual risk. Although only two of the three participants' ORF scores no longer placed them in the risk range by the end of the study, all participants (a) were on upward trends, (b) met realistic goals, and (c) exceeded ambitious goals. It appears that for these students the intervention narrowed the gap between actual and expected performance. Interventions that narrow the gap are critical, even if the gap is not completely closed during one school year (Oakes et al., 2010).

OFF-TASK BEHAVIOR

It is difficult for teachers to provide effective instruction when students are engaged in disruptive behaviors (Sutherland, Lewis-Palmer, Stichert, & Morgan, 2008). The second and fourth research questions addressed the effects of various phases on

student OTB. Specifically, the second research question focused on the effect of the fluency-building component on student behavior. As noted previously, phase changes were dictated by student performance on the reading measures. Prior to phase change (baseline to fluency-building), two students were on upward trends for OTB while the data for one student demonstrated a decreasing trend. It was interesting to note that upon implementation of the fluency-building condition, an experimental effect on OTB was noted for one of the students on an upward trend during baseline. Despite data demonstrating an initial experimental effect (decrease in OTB) from baseline to fluency-building for one student, visual analysis indicated that OTB increased for this student across the fluency-building phase. Two participants demonstrated decreasing trends in OTB during the fluency-building condition. It should be noted that two of the three participants demonstrated relatively low levels of OTB (during baseline). It was hypothesized that the fluency building condition would not have an effect on student OTB. *PND* results supported this hypothesis, indicating the fluency-building component had no effect on the OTB performance of two students and a questionable effect for one student. Nevertheless as with ORF and WIF performance, further data analysis appeared to support an effect of the fluency-building condition on OTB performance. The fluency-building condition may have had an effect on student behavior because students were expected to read aloud to the interventionist for a predetermined amount of time. During this time, the student was also given immediate corrective feedback. It should be noted, however, that during the baseline (*Fundation*s) condition students were provided with immediate corrective feedback, and checks for understanding were also conducted. Another reason for the decrease in OTB performance may be attributed to self-charting of progress. During this phase, each student was expected to chart his/her ORF progress during this phase. One participant commented that he was excited to "do better" each

time he read. Another participant noted that he wanted to see "how high [on the chart]" he could get. It is possible that self-charting (i.e., graphing their own progress) may have motivated the students to attend to the task.

The fourth research question addressed the impact of the TSG-mod condition on student behavior. It was hypothesized that the addition of the TSG-mod condition would result in decreases in student OTB. All students demonstrated decreases in OTB during this condition. *PND* results indicated that the TSG-mod condition was very effective for one participant, effective for another participant. Despite a decrease in *mean* OTB and two instances of 0% OTB, *PND* indicated a questionable effect for one participant. This may be an artifact of a floor effect in the previous phase—that is, behavior was so low during the fluency-building phase that an effect may have been difficult to demonstrate during the TSG-mod condition. Still, mean OTB decreased for all students during the TSG-mod condition over the previous condition with participants spending, on average, less than 9% of session time off task.

Additive Effects of the TSG-mod Condition

Identifying interventions that address both challenging student behaviors and areas of academic need are necessary (Vannest et al., 2009). The TSG-mod condition was added to the supplemental reading program (*Fundations*) and fluency-building condition to evaluate the effect the intervention package on participant behavior and reading performance. Therefore, the final research question was twofold: addressing the effect of the TSG-mod condition on the rate of both reading (ORF and WIF) and behavior (OTB). For two students, the implementation of the TSG-mod phase resulted in greater ORF gains (slope increases) over the fluency-building phase. The implementation of the TSG-mod phase also resulted in greater gains in WIF performance for two students.

Additionally, once the TSG-mod condition was implemented, further decreases in student OTB were noted beyond those demonstrated in the fluency-building condition. Although slope decreases in OTB were greater for two students during the fluency-building condition, mean OTB decreased substantially for all participants during TSG-mod. For the two younger participants, an increase in OTB and decreases in reading performance were noted during week 15. It should be noted that during week 15, a new student arrived in the classroom and may have had an effect on participants' academic and behavioral performance.

Overall, it can be concluded that the implementation of the TSG-mod condition was associated with increased student ORF and WIF performance and reduced OTB. The TSG-mod condition was more effective for increasing the WIF performance of two participants over the fluency-building component alone. In addition, the TSG-mod condition was more effective for increasing the ORF performance of two students. As noted earlier, at the conclusion of the study two students demonstrated ORF scores below the DIBELS end of year benchmark for their grade, but were no longer in the risk range. Despite considerable increases in ORF across phases, one student's ORF scores still placed him in the risk range at the conclusion of the study. A pattern became evident when analyzing reading fluency (ORF and WIF) and OTB data. Similar to the findings of Lane and colleagues (2001), findings from this study indicated a negative association between behavior and reading—that is, that when OTB increased, a decrease in ORF and/or WIF was also observed. Findings from this study indicated that when behavior increased, a decrease in ORF and/or WIF was observed. Although these findings do not answer all of the questions pertaining to the reciprocal relationship between reading and behavior, they may contribute to the discussion. Research has noted that students with and at-risk for EBD spend less time engaged in academic activities (Vaughn et al., 2002).

Likewise, research has documented the persistent underachievement of this population (e.g., Wagner et al., 2005). It stands to reason, then, that increased academic engagement (or decreased time off task) may produce increases in academic achievement. As students' OTB decreases, they may spend more time attending to the lesson, thus increasing their opportunities for learning. Researchers have concluded that increased engaged time influences academic achievement (Greenwood, Horton, & Utley, 2002; Marks, 2000; Slavin, 2003), which may be operating here with these students. Despite *PND* results indicating variable effects, TSG-mod appeared to be more effective than the fluency-building condition for one participant on ORF, OTB, and WIF performance; for another on WIF performance; and, for one student on ORF performance.

LIMITATIONS

Results of the study should be interpreted with several limitations in mind. First, there are limitations associated with the generalizability of results based on the inclusion of only three study participants. Future research should be conducted with a larger sample of students, possibly within a multiple baseline across groups or pairs design or in a control-comparison group design. Using such a design may increase thee generalizability of results, particularly if students/groups were in different schools and/or districts.

The intervention was described as a secondary tier intervention despite the instructional delivery format utilized (i.e., one-on-one administration). The *atypical* nature of the delivery of the intervention limits the interpretations of the findings regarding the efficacy of the intervention as a secondary tier intervention for the targeted population. Specifically, typical secondary tier interventions are administered to small groups of students. During this study, the intervention was implemented one-on-one with each student individually. Although the one-on-one intensity with which this intervention

was implemented is a common characteristic of tertiary interventions, the frequency (i.e., 3 days per week) and duration (i.e., 30-min per day) of the intervention sessions were typical of traditional secondary tier interventions.

Although fluency was not demonstrated to be irreversible during this study, students did demonstrate decreased performance in ORF and WIF at various points in time across phases. It is likely that this decrease in performance had to do with the variation in readability of the ORF probes, though the same cannot be said for the WIF probes. Therefore, alternate outcome measures could be utilized, to include pre- and post-assessment using norm-referenced measures. Additionally, the interpretation of growth in ORF and WIF, and decreases in OTB should be considered in relation to non-risk peers. Although Caesar demonstrated increases in ORF during the TSG-mod phase, ORF by the final week of intervention still placed him in the "at-risk" category, on the DIBELS ORF benchmarks.

An additional limitation pertains to the social validity of the intervention and OTB. The classroom teacher should have been asked to complete intervention acceptability surveys for each participant to ascertain the perceived social validity of the intervention for each participant. It is possible that the intervention may appear to be more socially acceptable for one student over another, based on pre-intervention behavioral concerns.

Additionally, the desired level of OTB should be assessed prior to the implementation of the study to determine if the student was able to make satisfactory, or expected, progress toward the goal. The efficacy of the intervention on the OTB of participants should be interpreted with caution. Some participants, for example, Amari, demonstrated low levels of OTB prior to intervention phases. Immediately following implementation of the TSG-mod phase slight increases in OTB were observed, with

decreases noted over time. Due to low levels of OTB at onset, change yielded by the intervention was difficult to demonstrate. It could be argued that students such as Amari did not need a behavioral support and any effects would be minimal. However, the researcher was concerned with any additive effects of the TSG-mod condition on behavior and reading performance. As noted previously, this study sought to address the lack of research providing both academic and behavior outcomes for this population.

Lastly, the researcher used *PND* as a measure of intervention effect. Although alternate effect-size indices are available (Parker, Vannest, & Davis, 2011), *PND* was the selected method for analysis as some indices were not applicable for this study. For example, percent of all non-overlapping data (*PAND*; Parker, Hagan-Burke, & Vannest, 2007) requires a minimum of 20 data points per participant. In this study, each participant had 16 data points per variable; therefore, *PAND* could not be applied.

IMPLICATIONS

The intervention package has practical applications in schools. First, the intervention was supplemental to the core reading instruction and implemented within a tiered model of reading delivery. Students received targeted intervention within the classroom setting, during typical reading instruction time. Social validity outcomes indicated that the classroom teacher identified the intervention as effective. The TSG-mod component is a low-cost, easily implemented behavior support strategy that can be implemented during targeted one-on-one instruction in reading for students at-risk of EBD. Although the pairing of positive behavioral supports with targeted *small group* instruction was not investigated, the impact for individual students is supported by the findings of the study and may transfer into the small group settings typical of a traditional secondary tier intervention delivery approach.

Finally, the results of this study support the inclusion of behavioral supports paired with secondary tier reading interventions to increase reading fluency skills acquisition. The additive effect of the behavior component produced greater gains in fluency acquisition than without those supports in place. The findings of this study support the inclusion of the TSG-mod with the implemented fluency-building component to increase student reading fluency, particularly for students demonstrating both reading and behavior risk. Findings support the implication that the intervention holds promise particularly among early elementary students who exhibit challenging behaviors and significant reading difficulties. Having multiple options available at the secondary intervention level, to include intervention packages, to address the varied needs of learners may result in improved outcomes, as demonstrated by this study.

FUTURE DIRECTIONS

Future research should examine how different behavior risk groups (ie., externalizing, internalizing and attention) respond to multi-component interventions, such as the intervention implemented in this study. As noted previously, several factors (e.g., setting, classroom schedule) contributed to the *atypical* instructional delivery format of this secondary tier intervention during the study. Although the intensity with which this intervention was implemented (i.e., one-on-one) is a common characteristic of tertiary interventions, the frequency (i.e., 3 days per week) and duration (i.e., 30-min per day) of the intervention sessions was typical of traditional secondary tier interventions. Still, replication of the intervention administered to small groups would add to the literature on *true* secondary tier interventions for this population of students. Replication of this study with a larger sample size and with participants from different grades would further expand the literature on interventions for students with dual risk. In addition, replications

of this study with the teacher or reading specialist as interventionist can prove informative as well as suggest the level of sustainability.

Landrum and colleagues (2003) espouse the idea that interventions currently validated with students displaying different learning, behavioral or social problems that are typical of the EBD population can be used with this population; though future research is needed to validate the efficacy of the practices among the EBD population. Replications of previously successful studies, especially those using single subject design methods, need to be conducted to strengthen, validate, and support generalization across the EBD population.

Researchers agree that more research is needed within the area of effective reading interventions for students with and at-risk of EBD (e.g., (Hinshaw, 1992; Landrum et al., 2003;Vannest et al., 2009). Specifically, future research should include reading interventions with behavioral supports (Hinshaw, 1992; Landrum et al., 2003; Levy & Chard, 2001; Mooney et al., 2004; Vannest et al., 2009). There should also be greater emphasis on longitudinal studies with long-term interventions that enable researchers to (a) assess the impact on progress over time and (b) report findings in terms of how adequate yearly progress is reported (Mooney et al., 2004). Mooney and colleagues (2004) also pointed to the importance of research indicating whether or not students receiving interventions are catching up to their peers without disabilities. Although one year of growth within a school year is a positive outcome, this population tends to be significantly behind their same age peers in academic areas. One year of growth each school year will not allow these students to reach the levels attained by their peers without disabilities. Instead, intensive interventions must be developed that allow for significant growth in as little time as possible. Future research should look at varying duration and intensity of interventions with students with or at-risk for EBD, to determine

if responses to intervention increase with longer durations and/or greater intensity. Information gleaned from such research stands to impact classroom practice.

Instruction for at-risk students must be more explicit and comprehensive, with a greater number of teaching and learning opportunities per day than typical classroom instruction provides (Torgesen, 2002). This observation makes the finding of Coleman and Vaughn (2000), that students spend more than half of their time engaged in independent seatwork, much more alarming. Although the components of the supplemental reading program (*Fundations*) incorporated direct and explicit instruction, with immediate feedback, this study found that participants responded more positively to the targeted intervention (fluency-building) involving direct and explicit feedback from the interventionist. Future research could investigate the impact of frequent opportunities to respond and differences in response types on the reading and behavior outcomes of students with dual risk. Interventions that incorporate direct instruction of skills and ongoing academic and behavioral progress monitoring (Landrum et al., 2003) could be informative.

SUMMARY

This chapter discussed the findings of this study pertaining to the effects of a multi-component, secondary tier intervention on the reading and behavioral performance of three students with challenging behaviors. A discussion of findings regarding the intervention effects on ORF and WIF was presented. Findings related to intervention effects on OTB and potential factors (i.e., low OTB scores during baseline and the fluency-building condition) that could explain the low levels of observed OTB were then discussed. With regard to the final research question pertaining to the additive effects of the TSG-mod condition on ORF, WIF, and OTB, study results indicated that among

students with dual risk, decreases were noted in OTB and meaningful gains were noted in both ORF and WIF. This study extends the research base on the ORF and WIF growth of students with dual risk. In addition, this study contributes to the literature on the (a) additive effects of individual components of multicomponent interventions and (b) secondary tier interventions targeting both the academic and behavioral performance of students with dual risk.

Appendix A

OFF-TASK BEHAVIOR DATA COLLECTION FORM

Momentary Time Sampling Form

Participant's Name: _____ Observer:_____

Week #: _____ Date: _____

Behavior Definition (in specific, observable, measurable terms): Defined as not having eyes orientated toward the assigned material or task. Some examples of OTB included: (a) talking to a peer or the researcher about something other than the assigned task (talking about the task is considered on-task behavior for the purposes of the study); (b) looking around the classroom (e.g., at other students or adults in the classroom); and (c) being out of seat for non-task related purpose (e.g., using the restroom, getting a drink) (based on Shapiro, 2004).

Total Observation Time: __30 min__ Length of each interval: __10 s__

Minute	Interval					
	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						

20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
Total Occurrences (X)			**Total Non-Occurrences (-)**			
%age OTB = ((Tx/Tx+T-) * 100)				**Rate OTB/min = (Tx/30)**		

Adapted from: Tieghi-Benet, M. C., Miller, K., Reiners, J., Robinett, B. E. Freeman, R. L., Smith, C. L., Baer, D., Palmer, A. (2003). Encouraging Student Progress (ESP), Student/ team book. Lawrence, KS: University of Kansas.

Appendix B

READING PROGRESS CHART

80													
75													
70													
65													
60													
55													
50													
45													
40													
35													
30													
25													
20													
15													
10													
5													

Week

Probe #

Appendix C

INTERVENTION IMPLEMENTATION CHECKLISTS

Intervention Implementation Checklist
Fundations (Phase A)

Interventionist: Week:
Participant ID:

Fundations	Present?		
1. Materials are ready to begin for the student and teacher?			
2. Behavioral expectations stated?			
3. Drill Sounds?			
4. Echo Find Letters and Words?			
5. Dictation with tiles, on white boards or in composition books?			
6. Does the interventionist ecourage students to tap sounds if they do not independently do so?			
7. Was appropriate corrective feedback given?			
8. Were Trick words practiced?			
Duration of lesson:		/8*100	=
Total			

Note. If the component is present, write ' 1 ' ; if the component is not present write '0'. Adapted from Gresham, F. M. (1989). Assessment of treatment integrity in school consultation and prereferral intervention. School Psychology Review, 18, 37-50. Adapted from Lane, K. L., & Beebe-Frankenberger, M. E. (2004). School-based interventions: The tools you need to succeed. Boston: Allyn & Bacon.

Intervention Implementation Checklist
Fundations + Fluency (Phase B)

Interventionist: Week:
Participant ID:

Component	Present?		
Fundations			
1. Materials are ready to begin for the student and teacher?			
2. Behavioral expectations stated?			
3. Drill Sounds?			
4. Echo Find Letters and Words?			
5. Dictation with tiles, on white boards or in composition books?			
6. Does the interventionist ecourage students to tap sounds if they do not independently do so?			
7. Was appropriate corrective feedback given?			
8. Were Trick words practiced?			
Duration of lesson: Total		/8*100	=

Voyagers-Repeated Readings			
1. Explained activity correctly and clearly?			
2. Distributed folder/binder with Voyager's Blast Off to Reading materials to student?			
3. Prompted student to begin first reading?			
4. Provided corrective feedback following the first reading?			
5. Prompted student to begin second reading?			
6. Provided corrective feedback following the second reading?			
7. Prompted student to begin third reading?			
8. Provided feedback following third reading?			
9. Student graphs progress on chart for words correct?			
10. Student moved on to the next passage when criteria is met?			
11. Praised student when meeting page goal (errors < 3, completed in 1 minute)?			
		/11*100	=

Total			

Note. If the component is present, write ' 1 ' ; if the component is not present write '0'. Adapted from Gresham, F. M. (1989). Assessment of treatment integrity in school consultation and prereferral intervention. School Psychology Review, 18, 37-50. Adapted from Lane, K. L., & Beebe-Frankenberger, M. E. (2004). School-based interventions: The tools you need to succeed.Boston: Allyn & Bacon.

Intervention Implementation Checklist

Fundations + Fluency (Phase B) + TSG-mod

Interventionist: Week:

Participant ID:

Component	Present?		
Fundations			
1. Materials are ready to begin for the student and teacher?			
2. Behavioral expectations stated?			
3. Drill Sounds?			
4. Echo Find Letters and Words?			
5. Dictation with tiles, on white boards or in composition books?			
6. Does the interventionist ecourage students to tap sounds if they do not independently do so?			
7. Was appropriate corrective feedback given?			
8. Were Trick words practiced?			
Duration of lesson: Total		/8*100	=

Voyagers-Repeated Readings	
1. Explained activity correctly and clearly?	
2. Distributed folder/binder with Voyager's Blast Off to Reading materials to student?	
3. Prompted student to begin first reading?	
4. Provided corrective feedback following the first reading?	
5. Prompted student to begin second reading?	
6. Provided corrective feedback following the second reading?	
7. Prompted student to begin third reading?	
8. Provided feedback following third reading?	
9. Student graphs progress on chart for words correct?	
10. Student moved on to the next passage when criteria is met?	

11. Praised student when meeting page goal (errors < 3, completed in 1 minute)?			
Total		/11*100	=

Behavior Game

1. Student prompted to make the T-chart for recording points			
2. Expected behaviors are specifically praised and student prompted to give self a point?			
3. Unexpected behaviors addressed (i.e., teacher identifies the undesired behavior and desired replacement behaior) and student prompted to give teacher a point?			
4. Student prompted to tally points?			
5a. If student has more points than the interventionist, he/she receives a sticker?			
5b. If student has fewer points that the interventionist, his/her participation is acknowledged and he/she is encouraged to earn a sticker during the next session?			
Total		/5*100	=

Note. If the component is present, write ' 1 ' ; if the component is not present write '0'. Adapted from Gresham, F. M. (1989). Assessment of treatment integrity in school consultation and prereferral intervention. School Psychology Review, 18, 37-50. Adapted from Lane, K. L., & Beebe-Frankenberger, M. E. (2004). School-based interventions: The tools you need to succeed.Boston: Allyn & Bacon.

Appendix D

SOCIAL VALIDITY SURVEYS

Student Pre-intervention Acceptability Rating Survey

Date: _____

Student Name: _____

Place the sheet in front of the student. Read each items and ask the student to circle the number of stars that best tells how much he/she feels about the item.

	How much?			
	(1)	(2)	(3)	(4)
1. I know about the steps to help me learn.	*	**	***	****
2. I can do the steps to learn.	*	**	***	****
3. I like what I will earn to do my best.	*	**	***	****
4. I will do my best work.	*	**	***	****
5. The new skills I will learn will help me.	*	**	***	****
6. I like the plan to help me learn.	*	**	***	****

Adapted from Lane, K. L. & Beebe-Frankenberger, M. E. (2004). *School-based interventions: The tools you need to succeed.* Boston: Allyn & Bacon.

Student Post-intervention Acceptability Rating Survey

Date: _____

Student Name: _____
Place the sheet in front of the student. Read each items and ask the student to circle the number of stars that best tells how much he/she feels about the it

	How much?			
	(1)	(2)	(3)	(4)
1. I did all the steps to help me learn.	*	**	***	****
2. It was easy to do the steps to learn.	*	**	***	****
3. I like what I earned to do my best.	*	**	***	****
4. I did my best work.	*	**	***	****
5. The new skills I learned helped me.	*	**	***	****
6. I liked the plan to help me learn.	*	**	***	****

Adapted from Lane, K. L. & Beebe-Frankenberger, M. E. (2004). *School-based interventions: The tools you need to succeed.* Boston: Allyn & Bacon.

Teacher Pre-intervention Acceptability Rating Survey

Date: _____

Name: _____

For each item, please circle the number that most closely represents your opinion about the proposed intervention.

Teacher Post-intervention Acceptability Rating Survey

	Strongly Disagree		Neutral 50/50		Strongly Agree
The proposed intervention will:					
1. fit into the regular schedule	1	2	3	4	5
2. not take too much time	1	2	3	4	5
3. teach important skills	1	2	3	4	5
4. be a fair way to address reading fluency	1	2	3	4	5
5. be a fair way to address off-task behavior	1	2	3	4	5
6. be appropriate to address reading fluency	1	2	3	4	5
7. be appropriate to address off-task behavior	1	2	3	4	5
8. be suitable given the classroom culture	1	2	3	4	5
9. quickly improve the students' skill	1	2	3	4	5
10. be acceptable to other students	1	2	3	4	5
11. have lasting positive effects	1	2	3	4	5
12. improve students' overall performance	1	2	3	4	5

Adapted from Lane, K. L. & Beebe-Frankenberger, M. E. (2004). *School-based interventions: The tools you need to succeed.* Boston: Allyn & Bacon.

Teacher Post-intervention Acceptability Rating Survey

Date: _____

Name: _____

For each item, please circle the number that most closely represents your opinion about the proposed intervention

	Strongly Disagree		Neutral 50/50		Strongly Agree
The intervention:					
1. fit into the regular schedule	1	2	3	4	5
2. did not take too much time	1	2	3	4	5
3. taught important skills	1	2	3	4	5
4. was a fair way to address reading fluency	1	2	3	4	5
5. was a fair way to address off-task behavior	1	2	3	4	5
6. was appropriate to address reading fluency	1	2	3	4	5
7. was appropriate to address off-task behavior	1	2	3	4	5
8. was suitable given the classroom culture	1	2	3	4	5
9. quickly improved the students' skill	1	2	3	4	5
10. was acceptable to students	1	2	3	4	5
11. will have lasting positive effects	1	2	3	4	5
12. improved students' overall performance	1	2	3	4	5

Adapted from Lane, K. L. & Beebe-Frankenberger, M. E. (2004). *School-based interventions: The tools you need to succeed.* Boston: Allyn & Bacon.

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